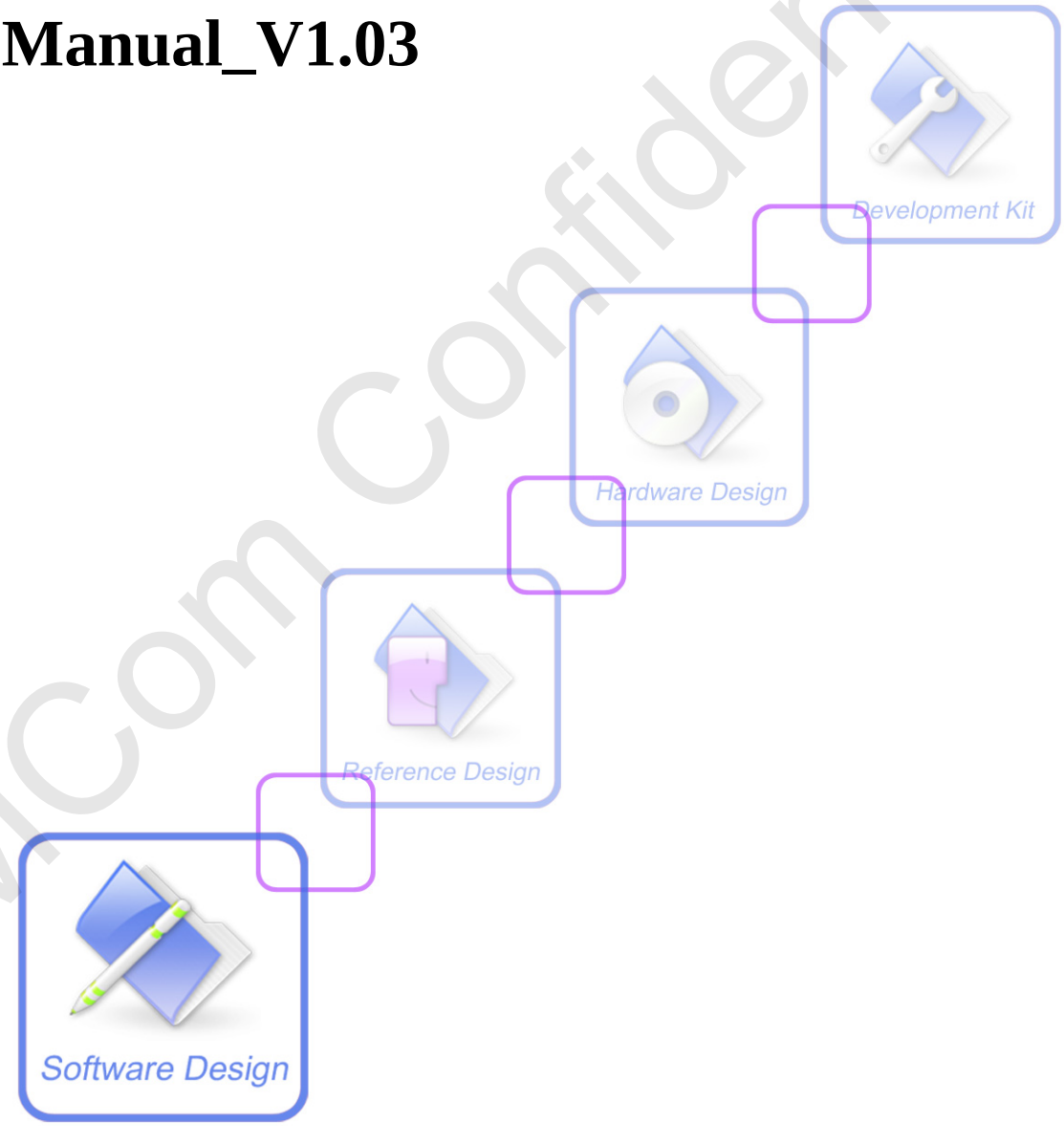
SIM7020 Series_AT Command Manual_V1.03



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1 Introduction

1.1 Scope of the document

This document presents the AT Command Set for SIMCom SIM7020 Series, including SIM7020C, SIM7020E, SIM7020G, SIM7030, SIM7060, SIM7060C, SIM7060G and SIM7060R.

1.2 Related documents

You can visit the SIMCom Website using the following link:
http://www.simcom.com

1.3 Conventions and abbreviations

In this document, the GSM engines are referred to as following term:
ME (Mobile Equipment);
MS (Mobile Station);
TA (Terminal Adapter);
DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board);

In application, controlling device controls the GSM engine by sending AT Command via its serial interface. The controlling device at the other end of the serial line is referred to as following term:
TE (Terminal Equipment);
DTE (Data Terminal Equipment) or plainly "the application" which is running on an embedded system.

1.4 AT Command syntax

The "AT" or "at" or "aT" or "At" prefix must be set at the beginning of each Command line. To terminate a Command line enter **<CR>**.
Commands are usually followed by a response that includes.
"<CR><LF><response><CR><LF>"
Throughout this document, only the responses are presented,**<CR><LF>** are omitted intentionally.

The AT Command set implemented by SIM7020 Series is a combination of 3GPP TS 27.005, 3GPP TS 27.007 and ITU-T recommendation V.25ter and the AT commands developed by SIMCom.

Note: Only enter AT Command through serial port after SIM7020 Series is powered on and Unsolicited Result Code "RDY" is received from serial port. If auto-bauding is enabled, the Unsolicited Result Codes "RDY" and so on are not indicated when you start up the ME, and the "AT" prefix, or "at" prefix must be set at the beginning of each command line.

All these AT commands can be split into three categories syntactically: "**basic**", "**S parameter**", and "**extended**". These are as follows:

1.4.1 Basic syntax

These AT commands have the format of "**AT<*x*><*n*>**", or "**AT&<x><n>**", where "**<*x*>**"is the Command, and "**<*n*>**"is/are the argument(s) for that Command. An example of this is "**ATE<*n*>**", which tells the DCE whether received characters should be echoed back to the DTE according to the value of "**<*n*>**". "**<*n*>**" is optional and a default will be used if missing.

1.4.2 S Parameter syntax

These AT commands have the format of "**ATS<*n*>=<*m*>**", where "**<*n*>**" is the index of the **S** register to set, and "**<*m*>**"is the value to assign to it. "**<*m*>**" is optional; if it is missing, then a default value is assigned.

1.4.3 Extended Syntax

These commands can operate in several modes, as in the following table:

Table 1: Types of AT commands and responses

Test Command	AT+<*x*>=?	The mobile equipment returns the list of parameters and value ranges set with the corresponding Write Command or by internal processes.
Read Command	AT+<*x*>?	This command returns the currently set value of the parameter or parameters.
Write Command	AT+<x>=<…>	This command sets the user-definable parameter values.
Execution Command	AT+<x>	The execution command reads non-variable parameters affected by internal processes in the GSM engine.

1.4.4 Combining AT commands on the same Command line

You can enter several AT commands on the same line. In this case, you do not need to type the "**AT**" or "**at**" prefix before every command. Instead, you only need type "**AT**" or "**at**" the beginning of the command line. Please note to use a semicolon as the command delimiter after an extended command; in basic syntax or S parameter syntax, the semicolon need not enter, for example: ATE1Q0S0=1S3=13V1X4;+IFC=0,0;+IPR=115200.

The Command line buffer can accept a maximum of 2048 characters (counted from the first command without "AT" or "at" prefix). If the characters entered exceeded this number then none of the Command will executed and TA will return "**ERROR**".

1.4.5 Entering successive AT commands on separate lines

When you need to enter a series of AT commands on separate lines, please Note that you need to wait the final response (for example OK, CME error, CMS error) of last AT Command you entered before you enter the next AT Command.

1.5 Supported character sets

The SIM7020 Series AT Command interface defaults to the IRA character set. The SIM7020 Series supports the following character sets:
GSM format
UCS2
IRA
The character set can be set and interrogated using the "**AT+CSCS**" Command (3GPP TS 27.007). The character set is defined in GSM specification 3GPP TS 27.005.

The character set affects transmission and reception of SMS and SMS Cell Broadcast messages, the entry and display of phone book entries text field and SIM Application Toolkit alpha strings.

1.6 Flow control

Flow control is very important for correct communication between the GSM engine and DTE. For in the case such as a data or fax call, the sending device is transferring data faster than the receiving side is ready to accept. When the receiving buffer reaches its capacity, the receiving device should be capable to cause the sending device to pause until it catches up.

There are basically two approaches to achieve data flow control: software flow control and hardware flow control. SIM7020 Series support both two kinds of flow control.
In Multiplex mode, it is recommended to use the hardware flow control.

1.6.1 Software flow control (XON/XOFF flow control)

Software flow control sends different characters to stop (XOFF, decimal 19) and resume (XON, decimal 17) data flow. It is quite useful in some applications that only use three wires on the serial interface.

The default flow control approach of SIM7020 Series is hardware flow control (RTS/CTS flow control), to enable software flow control in the DTE interface and within GSM engine, type the following AT Command:
AT+IFC=1, 1

Ensure that any communications software package (e.g. Hyper terminal) uses software flow control.

NOTE:
Software Flow control should not be used for data calls where binary data will be transmitted or received (e.g. TCP/IP) as the DTE interface may interpret binary data as flow control characters.

1.6.2 Hardware flow control (RTS/CTS flow control)

Hardware flow control achieves the data flow control by controlling the RTS/CTS line. When the data transfer should be suspended, the CTS line is set inactive until the transfer from the receiving buffer has completed. When the receiving buffer is ok to receive more data, CTS goes active once again.

To achieve hardware flow control, ensure that the RTS/CTS lines are present on your application platform.

1.7 Definitions

1.7.1 Parameter Saving Mode

For the purposes of the present document, the following syntactical definitions apply:

- **NO_SAVE**: The parameter of the current AT command will be lost if module is rebooted or current AT command doesn't have parameter.
- **AUTO_SAVE**: The parameter of the current AT command will be kept in NVRAM automatically and take in effect immediately, and it won't be lost if module is rebooted.
- **AUTO_SAVE_REBOOT**: The parameter of the current AT command will be kept in NVRAM automatically and take in effect after reboot, and it won't be lost if module is rebooted.
- **AT&W_SAVE**: The parameter of the current AT command will be kept in NVRAM by sending the command of "AT&W".
- -: "-" means this AT command doesn't care the parameter saving mode.

1.7.2 Max Response Time

Max response time is estimated maximum time to get response, the unit is seconds.
"-" means this AT command doesn't care the response time.

2 AT Commands According to V.25TER

These AT Commands are designed according to the ITU-T (International Telecommunication Union, Telecommunication sector) V.25ter document.

2.1 Overview of AT Commands According to V.25TER

Command	Description
ATE	Set command echo mode
ATI	Display product identification information
ATL	Set monitor speaker loudness
ATM	Set monitor speaker mode
ATN1	Some PC modem driver initial setting to handshake at highest speed larger than S37
ATO	Switch from command mode to data mode
ATP	Select pulse dialling
ATQ	Set result code presentation mode
ATS0	Set number of rings before automatically answering the call
ATS1	Ring counter
ATS2	Set escape sequence character
ATS3	Set command line termination character
ATS4	Set response formatting character
ATS5	Set command line editing character
ATS6	Pause before blind dialling
ATS7	Set number of seconds to wait for connection completion
ATS8	Set number of seconds to wait for comma dial modifier encountered in dial string of D command
ATS10	Set disconnect delay after indicating the absence of data carrier
ATS12	Set escape code guard time
ATS25	Set DTR change time
ATS95	Some PC modem driver initial setting to enable extended result codes
ATT	Select Tone Dialing
ATV	TA response format
ATX	Set connect result code format and monitor call progress
ATZ	Reset default configuration
AT&C	Set DCD function mode
AT&D	Set DTR function mode

AT&F	Factory defined configuration
AT&K	Flow control setting
AT&V	Display current configuration
AT&W	Store Active Profile
AT+DR	V.42bis data compression reporting control
AT+DS	V.42bis data compression control
AT+GCAP	Request complete TA capabilities list
AT+GMI	Request manufacturer identification
AT+GMM	Request TA model identification
AT+GMR	Request TA revision identification of software release
AT+GOI	Request global object identification
AT+GSN	Request TA serial number identification (IMEI)
AT+ICF	Set TE-TA control character framing
AT+IFC	Set TE-TA local data flow control
AT+ILRR	Set TE-TA Local rate reporting mode
AT+IPR	Set TE-TA fixed local rate
AT+FCLASS	Set Fax Class

2.2 Detailed Description of AT Commands According to V.25TER

2.2.1 ATE Set Command Echo Mode

ATE Set Command Echo Mode	
Execution Command **ATE<value>**	Response This setting determines whether or not the TA echoes characters received from TE during Command state. **OK**
	Parameters **<value>** 0 Echo mode off 1 Echo mode on
Parameter Saving Mode	
Max Response Time	-
Reference V.25ter	Note

2.2.2 ATI Display Product Identification Information

ATI Display Product Identification Information

Execution Command **ATI**	Response TA issues product information text. Example: **SIM7020 R1752** **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.3 ATL Set Monitor Speaker Loudness

ATL Set Monitor Speaker Loudness	
Execution Command **ATL<value>**	Response **OK**
	Parameters **<value>** 0..3 Volume
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note No effect in GSM

2.2.4 ATM Set Monitor Speaker Mode

ATM Set Monitor Speaker Mode	
Execution Command **ATM<value>**	Response **OK**
	Parameters **<value>** 0..2 Mode
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note No effect in GSM

2.2.5 ATN1 Some PC Modem Driver Initial Setting to Handshake at Highest Speed Larger Than S37

ATN1 Some PC Modem Driver Initial Setting to Handshake at Highest Speed Larger than S37	
Execution Command **ATN1**	Response **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.6 ATO Switch from Command Mode to Data Mode

ATO Switch from Command Mode to Data Mode	
Execution Command **ATO[n]**	Response TA resumes the connection and switches back from command mode to data mode. **CONNECT** If connection is not successfully resumed **ERROR** else TA returns to data mode from command mode **CONNECT <text>** Note: <**text**> only if parameter setting **ATX>0**
	Parameter **<n>** 0 Switch from command mode to data mode.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.7 ATQ Set Result Code Presentation Mode

ATQ Set Result Code Presentation Mode	
Execution Command **ATQ<n>**	Response This parameter setting determines whether or not the TA transmits any result code to the TE. Information text transmitted in response is not affected by

	this setting. If <**n**>=0: **OK** If <**n**>=1: (none)
	Parameters **<n>** 0 TA transmits result code 1 Result codes are suppressed and not transmitted
Parameter Saving Mode	
Max Response Time	-
Reference V.25ter	Note This command only affects V.250 AT commands and not all other AT commands in this specification (either 3GPP or MediaTek proprietary).

2.2.8 ATS0 Set Number of Rings before Automatically Answering the Call

ATS0 Set Number of Rings before Automatically Answering the Call	
Read Command **ATS0?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command **ATS0=<n>**	Response This parameter setting determines the number of rings before auto-answer. **OK** or **ERROR**
	Parameters **<n>** 0 Automatic answering is disable. 1-255 Number of rings the modem will wait for before answering the phone if a ring is detected.
Parameter Saving Mode	-
Max Response Time	-
Reference V.25ter	Note If <**n**> is set too high, the calling party may hang up before the call can be answered automatically. If using cmux port, ATH and AT+CHUP can hang up the call (automatically

	answering) only in the CMUX channel 0. If using dual-physical serial port, ATH and AT+CHUP can hang up the call (automatically answering) only in UART1.

2.2.9 ATS1 Ring Counter

ATS1 Ring counter	
Read Command **ATS1?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command **ATS1=<n>**	Response This command will not alert the RING counter,but simply display **OK** or **ERROR**
	Parameters **<n>** The number of **"RING"** strings sent to the TE as a result of receiving an incoming call. 0-255
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note If **"RING"** is not displayed on a particular channel due to other settings (such as suppression of all unsolicited events (ATQ)) then this value should not be incremented. This value is reset to 0 when receiving a new incoming call. Note that this command should also be made channel specific as with other ATS<x> commands.

2.2.10 ATS2 Set Escape Sequence Character

ATS3 Set Escape Sequence Character	
Read Command **ATS2?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command	Response

ATS2=<n>	This parameter setting determines the character recognized by the TA to indicate the escape sequence. **OK** or **ERROR**
	Parameters **<n>** 0-43-255 escape sequence character Note: default 43='+'
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.11 ATS3 Set Command Line Termination Character

ATS3 Set Command Line Termination Character	
Read Command **ATS3?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command **ATS3=<n>**	Response This parameter setting determines the character recognized by TA to terminate an incoming command line. The TA also returns this character in output. **OK** or **ERROR**
	Parameters **<n>** 0-13-127 Command line termination character
Parameter Saving Mode	-
Max Response Time	-
Reference V.25ter	Note Default 13=CR. It only supports default value.

2.2.12 ATS4 Set Response Formatting Character

ATS4 Set Response Formatting Character

Read Command **ATS4?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command **ATS4=<n>**	Response This parameter setting determines the character generated by the TA for result code and information text. **OK** or **ERROR**
	Parameters **<n>** 0-10-127 Response formatting character
Parameter Saving Mode	-
Max Response Time	-
Reference V.25ter	Note Default 10=LF. It only supports default value.

2.2.13 ATS5 Set Command Line Editing Character

ATS5 Set Command Line Editing Character	
Read Command **ATS5?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command **ATS5=<n>**	Response This parameter setting determines the character recognized by TA as a request to delete from the command line the immediately preceding character. **OK** or **ERROR**
	Parameters **<n>** 0-8-127 Response formatting character
Parameter Saving Mode	AT&W_SAVE
Max Response	-

Time	
Reference V.25ter	Note Default 8=Backspace.

2.2.14 ATS6 Pause Before Blind Dialling

ATS6 Pause Before Blind Dialling	
Read Command **ATS6?**	Response **<n>** **OK**
Write Command **ATS6=<n>**	Response **OK** or **ERROR**
	Parameters **<n>** 0-2-10 Time
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note No effect in GSM

2.2.15 ATS7 Set Number of Seconds to Wait for Connection Completion

ATS7 Set Number of Seconds to Wait for Connection Completion	
Read Command **ATS7?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command **ATS7=<n>**	Response This parameter setting determines the amount of time to wait for the connection completion in case of answering or originating a call. **OK** or **ERROR**
	Parameters **<n>** 1-60-255 Number of seconds to wait for connection completion
Parameter Saving Mode	AT&W_SAVE

Max Response Time	-
Reference V.25ter	Note If called party has specified a high value for ATS0=<n>, call setup may fail. The correlation between ATS7 and ATS0 is important Example: Call may fail if ATS7=30 and ATS0=20. ATS7 is only applicable to data call.

2.2.16 ATS8 Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command

ATS8 Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command	
Read Command **ATS8?**	Response **<n>** **OK**
	Parameters See Write Command
Write Command **ATS8=<n>**	Response **OK** or **ERROR**
	Parameters **<n>** 0 no pause when comma encountered in dial string 1-2-255 The value of this register determines how long the modem should pause when it sees a comma in the dialing string.
Parameter Saving Mode	-
Max Response Time	-
Reference V.25ter	Note No effect in GSM

2.2.17 ATS10 Set Disconnect Delay after Indicating the Absence of Data Carrier

ATS10 Set Disconnect Delay after Indicating the Absence of Data Carrier	
Read Command **ATS10?**	Response **<n>** **OK**
	Parameters See Write Command

Write Command **ATS10=<n>**	Response This parameter setting determines the amount of time that the TA will remain connected in absence of data carrier. If the data carrier is once more detected before disconnecting, the TA remains connected. **OK** or **ERROR**
	Parameters **<n>** 1-15-254 Number of tenths seconds of delay
Parameter Saving Mode	-
Max Response Time	-
Reference V.25ter	Note This command is not used, as there have been issues with in-band DCD dropping unexpectedly for CSD calls on some networks.

2.2.18 ATS12 Set Escape Code Guard Time

This command sets the escape code guard time in fiftieths of a second. The escape guard time is used to measure when to detect the +++ escape sequence has been entered by the PC in order to drop out of data mode back to AT command mode.

The guard time determines the time that forms a guard period before and after three escape sequence characters. In order to distinguish an escape sequence from just three escape sequence characters in the data stream there is timing associated to the three escape sequence characters of an escape sequence.

The time between the last byte of the data stream and the first escape sequence character must be at least the guard time and the time between each escape sequence character of the escape sequence must be less than the guard time and no other byte is received after the third escape sequence character for the time of the guard time. If an escape sequence is detected, the OK result code will be sent to the DTE. Otherwise, the DCE will stay in data mode.

For example: "<Guard time>+++<Guard time>"

ATS12 Set Escape Code Guard Time	
Read Command **ATS12?**	Response **<n>** **OK** NB: <n> is in 3 decimal digits format (e.g. Default value is given as 050). If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command	Response

ATS12=<n>	**OK** or **ERROR**
	Parameters **<n>** 0-50-255 Number of 20 ms.
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.19 ATS25 Set DTR Change Time

This command sets the S-register 25 Detect DTR change time that contain the threshold for noticing a change in DTR. This time permits to the modem to ignore DTR before taking action specified by &Dn (See AT&D Circuit 108 behavior).
The value unit is in 1/100 seconds. Default value is set to 5 (50ms delay after a DTR drop before the modem acts on it).

ATS25 Set DTR Change Time	
Read Command **ATS25?**	Response **<n>** **OK** NB: <n> is in 3 decimal digits format (e.g. Default value is given as 000). If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **ATS25=<n>**	Response **OK** or **ERROR**
	Parameters **<n>** 0-5-255 Number of 10 ms.
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.20 ATS95 Some PC Modem Driver Initial Setting to Enable Extended Result Codes

ATS95 Some PC Modem Driver Initial Setting to Enable Extended Result Codes	
Read Command **ATS95?**	Response **OK**
	Parameters See Write Command
Write Command **ATS95=<n>**	Response **OK** Some standard PC modem drivers will send this AT command to initialize the setting, but it is meaningless in the 3GPP standard. So we just return **"OK"** and no effect for the setting.
	Parameters **<n>** 0-255 Meaningless for the GSM, and GPRS/Packet Domain setting.
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.21 ATV TA Response Format

ATV TA Response Format	
Execution Command **ATV<value>**	Response This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses. When **<value>**=0 **0** When **<value>**=1 **OK**
	Parameters **<value>** 0 Information response: **<text><CR><LF>** Short result code format: **<numeric code><CR>** 1 Information response: **<CR><LF><text><CR><LF>** Long result code format: **<CR><LF><verbose code><CR><LF>** The result codes, their numeric equivalents and brief descriptions of the use of each are listed in the following table.
Parameter Saving Mode	AT&W_SAVE

Max Response Time	-
Reference V.25ter	Note

ATV1	ATV0	Description
OK	0	Acknowledges execution of a Command
CONNECT	1	A connection has been established; the DCE is moving from Command state to online data state
RING	2	The DCE has detected an incoming call signal from network
NO CARRIER	3	The connection has been terminated or the attempt to establish a connection failed
ERROR	4	Command not recognized, Command line maximum length exceeded, parameter value invalid, or other problem with processing the Command line
NO DIALTONE	6	No dial tone detected
BUSY	7	Engaged (busy) signal detected
NO ANSWER	8	"@" (Wait for Quiet Answer) dial modifier was used, but remote ringing followed by five seconds of silence was not detected before expiration of the connection timer (S7)
PROCEEDING	9	An AT command is being processed
CONNECT <text>	Manufacturer-specific	Same as CONNECT, but includes manufacturer-specific text that may specify DTE speed, line speed, error control, data compression, or other status

2.2.22 ATX Set CONNECT Result Code Format and Monitor Call Progress

ATX Set CONNECT Result Code Format and Monitor Call Progress	
Execution Command **ATX<value>**	Response This parameter setting determines whether or not the TA detected the presence of dial tone and busy signal and whether or not TA transmits particular result codes. **OK** or **ERROR**
	Parameters **<value>** 0 **CONNECT** result code only returned, dial tone and busy detection are both disabled. 1 **CONNECT<text>** result code only returned, dial tone and busy detection are both disabled.

	2 **CONNECT<text>** result code returned, dial tone detection is enabled, busy detection is disabled. 3 **CONNECT<text>** result code returned, dial tone detection is disabled, busy detection is enabled. 4 **CONNECT<text>** result code returned, dial tone and busy detection are both enabled.
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.23 ATZ Reset Default Configuration

ATZ Reset Default Configuration	
Execution Command **ATZ[<value>]**	Response TA sets all current parameters to the user defined profile. **OK** or **ERROR**
	Parameters **<value>** 0 Restore profile 0
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

Parameter impacted by Z command: refer to AT&W, and IFC will be set too.

2.2.24 AT&C Set DCD Function Mode

AT&C Set DCD Function Mode	
Execution Command **AT&C<value>**	Response This parameter determines how the state of circuit 109 (DCD) relates to the detection of received line signal from the distant end. **OK** or **ERROR**
	Parameters **<value>** 0 DCD line is always ON

	1 DCD line is ON only in the presence of data carrier
Parameter Saving Mode	-
Max Response Time	-
Reference V.25ter	Note

2.2.25 AT&D Set DTR Function Mode

AT&D Set DTR Function Mode	
Execution Command **AT&D[<value>]**	Response This parameter determines how the TA responds when circuit 108/2 (DTR) is changed from the ON to the OFF condition during data mode. **OK** or **ERROR**
	Parameters **<value>** 0 TA ignores status on DTR. 1 ON->OFF on DTR: Change to Command mode with remaining the connected call. 2 ON->OFF on DTR: Disconnect call, change to Command mode. During state DTR=OFF is auto-answer off.
Parameter Saving Mode	-
Max Response Time	-
Reference V.25ter	Note

2.2.26 AT&F Factory Defined Configuration

AT&F Factory Defined Configuration	
Execution Command **AT&F[<value>]**	Response TA sets all current parameters to the manufacturer defined profile. **OK**
	Parameters **<value>** 0 Set all TA parameters to manufacturer defaults.
Parameter Saving Mode	NO_SAVE
Max Response	-

Time	
Reference V.25ter	Note

Parameter impacted by &F command: refer to AT&W, and IFC will be set too.

2.2.27 AT&K Flow Control Setting

AT&K Flow Control Setting	
Execution Command **AT&K[<value>]**	Response **OK**
	Parameters **<value>** 0 No flow control 3 RTS /CTS flow control (hardware) 4 XON/XOFF flow control (software)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note This command does not store anything in the profile data because it sets the AT+IFC settings when used: ● AT&K0 is equivalent of entering AT+IFC=0,0 ● AT&K3 is equivalent of entering AT+IFC=2,2 ● AT&K4 is equivalent of entering AT+IFC=1,1

2.2.28 AT&V Display Current Configuration

AT&V Display Current Configuration	
Execution Command **AT&V[<n>]**	Response TA returns the current parameter setting. <**current configurations text**> **OK** or **ERROR**
	Parameters **<n>** 0 Responses in numeric format
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

V.25ter	

2.2.29 AT&W Store Active Profile

AT&W Store Active Profile	
Execution Command **AT&W[<n>]**	Response TA stores the current parameter setting in the user defined profile. **OK** or **ERROR**
	Parameters **<n>** 0 Store the current configuration in profile 0
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note The user defined profile is stored in non volatile memory.

Parameter stored by &W

Command	Parameter name	Displayedby &V
ATS0	<num>	Y
ATS3	<char>	Y
ATS4	<char>	Y
ATS5	<char>	Y
ATS6	<short>	Y
ATS7	<time>	Y
ATS8	<time>	Y
ATS10	<time>	Y
ATV	<format>	Y
ATE	<echo>	Y
ATQ	<result>	Y
ATX	<result>	Y
AT&C	<behavior>	Y
AT&D	<behavior>	Y
AT+CREG	<n>	Y
AT+CGREG	<n>	Y
AT+CMEE	<n>	Y
AT+CSCS	<chest>	Y

AT+CSMINS	<n>	Y
AT+EXUNSOL	<exunsol>	Y

2.2.30 AT+DR V.42bis data compression reporting control

AT+DR V.42bis data compression reporting control	
Test Command **AT+DR=?**	Response **+DR: (**list of supported **<value>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+DR?**	Response **+DR: <value>** **OK**
	Parameters See Write Command
Write Command **AT+DR=<value>**	Response This parameter setting determines whether the intermediate result code of the current data compressing is reported by TA to TE after a connection establishment. **OK**
	Parameters **<value>** 0 Reporting disabled 1 Reporting enabled
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.31 AT+DS V.42bis data compression control

AT+DS V.42bis data compression control	
Test Command **AT+DS=?**	Response **+DS: (**list of supported **<p0>**s**),(**list of supported **<n>**s**),(**list of supported **<p1>**s**),(**list of supported **<p2>**s**)** **OK**
	Parameters

	See Write Command
Read Command **AT+DS?**	Response **+DS: <p0>,<n>,<p1>,<p2>** **OK**
	Parameters See Write Command
Write Command **AT+DS=[<p0>[,<n>[,<p1>[,<p2>]]]]**	Response This parameter setting determines the possible data compression mode by TA at the compression negotiation with the remote TA after a call set up. **OK**
	Parameters **<p0>** 0 NONE 1 Transmit only 2 Receive only 3 Both direction, but allow negotiation **<n>** 0 Allow negotiation of p0 down 1 Do not allow negotiation of p0 - disconnect on difference **<p1>** 512-1024 Dictionary size ***Note: default determined by manufacturer*** **<p2>** 6-20-64 Maximum string size
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note only for data call. GSM transmits the data transparent. The remote TA may support this compression.

2.2.32 AT+GCAP Request Complete TA Capabilities List

AT+GCAP Request Complete TA Capabilities List	
Execution Command **AT+GCAP**	Response TA reports a list of additional capabilities. **+GCAP:** list of supported **<name>**s **OK**
	Parameters

	<name> +CGSM GSM function is supported
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.33 AT+GMI Request Manufacturer Identification

AT+GMI Request Manufacturer Identification	
Test Command **AT+GMI=?**	Response **OK**
Execution Command **AT+GMI**	TA reports one or more lines of information text which permit the user to identify the manufacturer. **SIMCOM_Ltd** **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.34 AT+GMM Request TA Model Identification

AT+GMM Request TA Model Identification	
Test Command **AT+GMM=?**	Response **OK**
Execution Command **AT+GMM**	TA reports one or more lines of information text which permit the user to identify the specific model of device. **<model>** **OK**
	Parameters **<model>** Product model identification text
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	Note
V.25ter	

2.2.35 AT+GMR Request TA Revision Identification of Software Release

AT+GMR Request TA Revision Identification of Software Release	
Test Command **AT+GMR=?**	Response **OK**
Execution Command **AT+GMR**	TA reports one or more lines of information text which permit the user to identify the revision of software release. **<revision>** **OK**
	Parameters **<revision>** Revision of software release
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.36 AT+GOI Request Global Object Identification

AT+GOI Request Global Object Identification	
Test Command **AT+GOI=?**	Response **OK**
Execution Command **AT+GOI**	Response TA reports one or more lines of information text which permit the user to identify the device, based on the ISO system for registering unique object identifiers. **<Object Id>** **OK**
	Parameters **<Object Id>** Identifier of device type see X.208, 209 for the format of <Object Id>
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	Note
V.25ter	

2.2.37 AT+GSN Request TA Serial Number Identification (IMEI)

AT+GSN Request TA Serial Number Identification(IMEI)	
Test Command **AT+GSN=?**	Response **OK**
Execution Command **AT+GSN**	Response TA reports the IMEI (international mobile equipment identifier) number in information text which permit the user to identify the individual ME device. **<sn>** **OK**
	Parameters **<sn>** IMEI of the telephone(International Mobile station Equipment Identity)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference V.25ter	Note The serial number (IMEI) is varied by individual ME device.

2.2.38 AT+ICF Set TE-TA Control Character Framing

AT+ICF Set TE-TA Control Character Framing	
Test Command **AT+ICF=?**	Response **+ICF: (**list of supported **<format>**s**),(**list of supported **<parity>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+ICF?**	Response **+ICF: <format>,<parity>** **OK**
	Parameters See Write Command
Write Command **AT+ICF=<format>[,<parity>]**	Response This parameter setting determines the serial interface character framing format and parity received by TA from TE.

	OK
	Parameters **<format>** 1 8 data 0 parity 2 stop 2 8 data 1 parity 1 stop 3 8 data 0 parity 1 stop 4 7 data 0 parity 2 stop 5 7 data 1 parity 1 stop 6 7 data 0 parity 1 stop **<parity>** 0 odd 1 even 2 mark(1) 3 space (0)
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note ● The Command is applied for Command state; ● In <format> parameter, "0 parity" means no parity; ● The <parity> field is ignored if the <format> field specifies no parity and string "+ICF: <format>,255" will be response to "AT+ICF?" Command.

2.2.39 AT+IFC Set TE-TA Local Data Flow Control

AT+IFC Set TE-TA Local Data Flow Control	
Test Command **AT+IFC=?**	Response **+IFC: (**list of supported **<dce_by_dte>**s**),(**list of supported **<dte_by_dce>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+IFC?**	Response **+IFC: <dce_by_dte>,<dte_by_dce>** **OK**
	Parameters See Write Command
Write Command **AT+IFC=<dce_b**	Response This parameter setting determines the data flow control on the serial

y_dte>[,<dte_by_dce>]	interface for data mode. **OK**
	Parameters **<dce_by_dte>** Specifies the method will be used by TE at receive of data from TA 0 No flow control 1 Software flow control 2 Hardware flow control **<dte_by_dce>** Specifies the method will be used by TA at receive of data from TE 0 No flow control 1 Software flow control 2 Hardware flow control
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference V.25ter	Note

2.2.40 AT+ILRR Set TE-TA Local rate reporting mode

AT+ILRR Set TE-TA Local rate reporting mode	
Test Command **AT+ILRR=?**	Response **+ILRR: (**list of supported <**value**>s**)** **OK**
	Parameters See Write Command
Read Command **AT+ILRR?**	Response **+ILRR: <value>** **OK**
	Parameters See Write Command
Write Command **AT+ILRR=<value>**	Response This parameter setting determines whether an intermediate result code of local rate is reported at connection establishment. The rate is applied after the result code of the connection is transmitted to TE. **OK**
	Parameters **<value>** 0 Disables reporting of local port rate

	1 Enables reporting of local port rate
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	V.25ter

2.2.41 AT+IPR Set TE-TA Fixed Local Rate

AT+IPR Set TE-TA Fixed Local Rate	
Test Command **AT+IPR=?**	Response **+IPR: (**list of supported auto detectable <**rate**>s**),(**list of supported fixed-only **<rate>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+IPR?**	Response **+IPR: <rate>** **OK**
	Parameters See Write Command
Write Command **AT+IPR=<rate>**	Response This parameter setting determines the data rate of the TA on the serial interface. The rate of Command takes effect following the issuance of any result code associated with the current Command line. **OK**
	Parameters **<rate>** Baud rate per second 0 110 300 1200 2400 4800 9600 19200 38400 57600 115200 230400

	460800 921600 3000000
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference V.25ter	Note Factory setting is "AT+IPR=0"(auto-bauding).

2.2.42 AT+FCLASS Set Fax Class

AT+FCLASS Set Fax Class	
Test Command **AT+FCLASS=?**	Response **+FCLASS:** (list of supported <**n**>s) **OK**
	Parameters See Write Command
Read Command **AT+FCLASS?**	Response **+FCLASS: <n>** **OK**
	Parameters See Write Command
Write Command **AT+FCLASS=<n>**	Response This command has no effect in NB-IoT and is supported for compatibility reasons. **OK**
	Parameters **<n>** 0 Data 1 Fax class 1 (TIA-578-A)
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference V.25ter	Note

3 AT Commands According to 3GPP TS 27.007

3.1 Overview of AT Command According to 3GPP TS 27.007

Command	Description
AT+CEER	Extended error report
AT+CGMI	Request manufacturer identification
AT+CGMM	Request model identification
AT+CGMR	Request TA revision identification of software release
AT+CGOI	Request global object identification
AT+CGSN	Request product serial number identification (identical with +GSN)
AT+CIMI	Request international mobile subscriber identity
AT+CLCK	Facility lock
AT+CMAR	Master reset
AT+CMEE	Report mobile equipment error
AT+COPS	Operator selection
AT+CPIN	Enter PIN
AT+CPWD	Change password
AT+CR	Service reporting control
AT+CREG	Network registration
AT+CRSM	Restricted SIM access
AT+CSCS	Select TE character set
AT+CSQ	Signal quality report
AT+CMUX	Multiplexer control
AT+CNUM	Subscriber number
AT+CPOL	Preferred operator list
AT+CFUN	Set phone functionality
AT+CCLK	Clock
AT+CSIM	Generic SIM access
AT+CBC	Battery charge
AT+CTZR	Time zone reporting
AT+CTZU	Automatic time zone update
AT+CPLS	Selection of preferred PLMN list
AT+CPSMS	Power saving mode selection
AT+CIPCA	Enable/disable activation of PDN connection on attach.
AT+CEDRXS	eDRX setting

AT+CEDRXRDP	eDRX read dynamic parameters
AT+CCHO	Open UICC logical channel
AT+CCHC	Close UICC logical channel
AT+CGLA	Generic UICC logical channel access
AT+CPINR	Remaining PIN retries
AT+CGATT	GPRS/Packet Domain attach or detach
AT+CGDCONT	Define PDP context
AT+CGACT	PDP context activate or deactivate
AT+CGPADDR	Show PDP address
AT+IPCONFIG	Show the Complete PDP Address
AT+CGEREP	Packet Domain Event Reporting
AT+CGREG	Network registration status
AT+CGCONTRDP	PDP Context Read Dynamic Parameters
AT+CGPIAF	Printing IP Address Format
AT+CGDEL	Delete Non-Active PDP Contexts
AT+CGAUTH	Define PDP Context Authentication Parameters
AT*MCGDEFCONT	Set Default PSD Connection Settings
AT+CEREG	EPS Network Registration Status
AT+CGDATA	Enter Data State

3.2 Detailed Descriptions of AT Command According to 3GPP TS 27.007

3.2.1 AT+CEER Extended Error Report

AT+CEER Extended Error Report	
Test Command **AT+CEER=?**	Response **+CEER: (**list of supported **<n>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CEER?**	Response **+CEER: <n>** **OK**
	Parameters See Write Command
Write Command	Response

AT+CEER=<n>	**OK**
	Parameter **<n>** 0 The reason for last call release as text code 1 The reason for last call release as number code
Execution Command **AT+CEER**	Response TA returns an extended report of the reason for the last call release. **+CEER: <report>** **OK**
	Parameters **<report>** If AT+CEER=0, return <**s**> **<s>** a string that represents the Cause If AT+CEER=1, return **Cause: <c>** **<c>** number representing the Cause
	Parameters **<c>(number) <s>(string)** 0 (No cause) 1 (unassigned (unallocated) number) 3 (no route to destination) 6 (channel unacceptable) 8 (operator determined barring) 16 (normal call clearing) 17 (user busy) 18 (no user responding) 19 (user alerting, no answer) 21 (call rejected) 22 (number changed) 26 (non-selected user clearing) 27 (destination out of order) 28 (invalid number format (incomplete number)) 29 (facility rejected) 30 (response to STATUS ENQUIRY) 31 (normal, unspecified) 34 (emergency call not possible) 38 (network out of order) 41 (temporary failure) 42 (switching equipment congestion) 43 (access information discarded) 44 (requested circuit/channel not available) 47 (resource unavailable, unspecified) 49 (quality of service unavailable) 50 (Requested facility not subscribed)

	55 (Incoming calls barred within the CUG) 57 (bearer capability not authorized) 58 (bearer capability not presently available) 63 (service or option not available, unspecified) 68 (ACM equal to or greater than ACMmax) 65 (bearer service not implemented) 69 (Requested facility not implemented) 70 (only restricted digital information bearer capability is available) 79 (service or option not implemented,unspecified) 81 (invalid transaction identifier value) 87 (user not member of CUG) 88 (incompatible destination) 91 (invalid transit network selection) 95 (semantically incorrect message) 96 (invalid mandatory information) 97 (message type non-existent or not implemented) 98 (message type not compatible with protocol state) 99 (information element non-existent or not implemented) 100 (conditional IE error) 101 (message not compatible with protocol state) 102 (recovery on timer expiry) 111 (protocol error, unspecified) 127 (interworking, unspecified)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.2 AT+CGMI Request Manufacturer Identification

AT+CGMI Request Manufacturer Identification	
Test Command **AT+CGMI=?**	Response **OK**
Execution Command **AT+CGMI**	Response TA returns manufacturer identification text. **<manufacturer>** **OK**
	Parameters

	<manufacturer> The ID of manufacturer
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.3 AT+CGMM Request Model Identification

AT+CGMM Request Model Identification	
Test Command **AT+CGMM=?**	Response **OK**
Execution Command **AT+CGMM**	Response TA returns product model identification text. **<model>** **OK**
	Parameters **<model>** Product model identification text
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.4 AT+CGMR Request TA Revision Identification of Software Release

AT+CGMR Request TA Revision Identification of Software Release	
Test Command **AT+CGMR=?**	Response **OK**
Execution Command **AT+CGMR**	Response TA returns product software version identification text. **<revision>** **OK**
	Parameters **<revision>** Product software version identification text
Parameter Saving	NO_SAVE

Mode	
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.5 AT+CGOI Request global object identification

AT+CGOI Request global object identification	
Test Command **AT+CGOI=?**	Response **OK**
Execution Command **AT+CGOI**	Response TA returns global object id. **<Object Id>** **OK**
	Parameters <**Object Id**> Identifier of device type
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.6 AT+CGSN Request Product Serial Number Identification

AT+CGSN Request Product Serial Number Identification (Identical with +GSN)	
Test Command **AT+CGSN=?**	Response **OK**
Execution Command **AT+CGSN**	Response see +GSN **<sn>** **OK**
	Parameters **<sn>** International mobile equipment identity (IMEI)
Parameter Saving Mode	NO_SAVE
Max Response	-

Time	
Reference 3GPP TS 27.007 [13]	Note

3.2.7 AT+CIMI Request International Mobile Subscriber Identity

AT+CIMI Request International Mobile Subscriber Identity	
Test Command **AT+CIMI=?**	Response **OK**
Execution Command **AT+CIMI**	Response TA returns <**IMSI**>for identifying the individual SIM which is attached to ME. **<IMSI>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<IMSI>** International Mobile Subscriber Identity (string without double quotes)
Parameter Saving Mode	NO_SAVE
Max Response Time	20s
Reference 3GPP TS 27.007 [13]	Note

3.2.8 AT+CLCK Facility Lock

AT+CLCK Facility Lock	
Test Command **AT+CLCK=?**	Response **+CLCK: (**list of supported **<fac**>s**)** **OK**
	Parameters See Write Command
Write Command **AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]**	Response This Command is used to lock, unlock or interrogate a ME or a network facility <**fac**>. Password is normally needed to do such actions. When querying the status of a network service (<**mode**>=2) the response line for 'not active' case (<**status**>=0) should be returned only if service is not

	active for any <**class**>. If <**mode**>≠2 and Command is successful **OK** If <**mode**>=2 and Command is successful **+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2>[…]]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<fac>** "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code. **<mode>** 0 unlock 1 lock 2 query status **<passwd>** String type (Shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD) **<class>** Field not required for NB-IOT, so will be ignored **<status>** 0 Not active 1 Active
Parameter Saving Mode	NO_SAVE
Max Response Time	15s
Reference 3GPP TS 27.007 [14]	Note ● CME errors if SIM not inserted or PIN is not entered.

3.2.9 AT+CMAR Master Reset

AT+CMAR Master Reset	
Test Command **AT+CMAR=?**	Response **OK**
	Parameters See Write Command
Write Command	Response

AT+CMAR=<phone lock code>	**OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**phone lock code**> String type; Security code (Phone Lock code) must be verified before performing the master reset.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.10 AT+CMEE Report Mobile Equipment Error

AT+CMEE Report Mobile Equipment Error	
Test Command **AT+CMEE=?**	Response **+CMEE: (**list of supported **<n>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CMEE?**	Response **+CMEE: <n>** **OK**
	Parameters See Write Command
Write Command **AT+CMEE=[<n>]**	Response TA disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the ME. **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<n>** 0 Disable **+CME ERROR: <err>** result code and use **ERROR** instead. 1 Enable **+CME ERROR: <err>** result code and use numeric **<err>** 2 Enable **+CME ERROR: <err>** result code and use verbose **<err>** values

Parameter Saving Mode	-
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.11 AT+COPS Operator Selection

AT+COPS Operator Selection	
Test Command **AT+COPS=?**	Response TA returns a list of quadruplets, each representing an operator present in the network. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM, and other networks. **+COPS:** (list of supported<**stat**>,long alphanumeric<**oper**>,short alphanumeric<**oper**>,numeric <**oper**>[,<**AcT**>])s[,,(list of supported <**mode**>s),(list of supported <**format**>s)] **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Read Command **AT+COPS?**	Response TA returns the current mode and the currently selected operator. If no operator is selected, <format> and <oper> are omitted. **+COPS: <mode>[,<format>,<oper>,<AcT>]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+COPS=<mode>[,<format>[,<oper>]]**	Response TA forces an attempt to select and register the GSM network operator. If the selected operator is not available, no other operator shall be selected (except <**mode**>=4). The selected operator name format shall apply to further read commands (AT+COPS?). **OK** If error is related to ME functionality:

	+CME ERROR: <err>
	Parameters **<stat>** 0 Unknown 1 Operator available 2 Operator current 3 Operator forbidden **<oper>** Refer to [27.007] operator in format as per <**format**> **<mode>** 0 Automatic mode; <**oper**> field is ignored 1 Manual (<**oper**> field shall be present, and <**AcT**> optionally) 2 Manual deregister from network 3 Set only <**format**> (for read Command +COPS?) - not shown in Read Command response 4 Manual/automatic (<**oper**> field shall be present); if manual selection fails, automatic mode (<**mode**>=0) is entered **<format>** 0 Long format alphanumeric <**oper**> 1 Short format alphanumeric <**oper**> 2 Numeric <**oper**>; GSM Location Area Identification number <**AcT**> 9 NB-IoT
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [14]	Note

3.2.12 AT+CPIN Enter PIN

AT+CPIN Enter PIN	
Test Command **AT+CPIN=?**	Response **OK**
Read Command **AT+CPIN?**	Response TA returns an alphanumeric string indicating whether some password is required or not. **+CPIN: <code>** **OK**
	Parameters

	<code> An alphanumeric string indicating whether some password is required or not READY MT is not pending for any password SIM PIN MT is waiting SIM PIN to be given SIM PUK MT is waiting for SIM PUK to be given PH_SIM PIN ME is waiting for phone to SIM card (antitheft) PH_SIM PUK ME is waiting for SIM PUK (antitheft) SIM PIN2 PIN2, e.g. for editing the FDN book possible only if preceding Command was acknowledged with +CME ERROR:17 SIM PUK2 Possible only if preceding Command was acknowledged with error +CME ERROR: 18. PH-SIM PIN ME is waiting for phone to SIM card (antitheft) PH-NET PIN Network personalization password is required. PH-NETSUB PIN Network subset is required. PH-SP PIN Service provider personalization password is required. PH-CORP PIN Corporate personalization password is required.
Write Command **AT+CPIN=<pin>[,<new pin>]**	Response TA stores a required password (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken and an error message, +CME ERROR, is returned to TE. If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <**new pin**>, is used to replace the old pin in the SIM. When a new password is set, a third optional parameter may also be specified. This extra parameter is compared to the new password to check they are equivalent as an additional security feature. **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<pin>** String type; password **<new pin>** String type; If the PIN required is SIM PUK or SIMPUK2: new password
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference 3GPP TS 27.007 [13]	Note

3.2.13 AT+CPWD Change Password

AT+CPWD Change Password	
Test Command **AT+CPWD=?**	Response TA returns a list of pairs which present the available facilities and the maximum length of their password. **+CPWD: (**list of supported **<fac>**s, list of supported **<pwdlength>**s**)** **OK**
	Parameters **<fac>** See Write Command **<pwdlength>** Integer max. length of password
Write Command **AT+CPWD=<fac>,<oldpwd>,<newpwd>**	Response TA sets a new password for the facility lock function. **OK**
	Parameters **<fac>** "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code. **<oldpwd>** String type (string should be included in quotation marks): password specified for the facility from the user interface or with command. If an old password has not yet been set, <**oldpwd**> is not to enter. **<newpwd>** String type (string should be included in quotation marks): new password
Parameter Saving Mode	NO_SAVE
Max Response Time	15s
Reference 3GPP TS 27.007 [13]	Note

3.2.14 AT+CR Service Reporting Control

AT+CR Service Reporting Control	
Test Command **AT+CR=?**	Response **+CR: (**list of supported **<mode>**s) **OK**
	Parameters See Write Command
Read Command	Response

AT+CR?	**+CR: <mode>** **OK**
	Parameters See Write Command
Write Command **AT+CR=[<mode>]**	Response TA controls whether or not intermediate result code **+CR: <serv>** is returned from the TA to the TE at a call set up. **OK**
	Parameters **<mode>** 0 Disable 1 Enable 2 Enable MediaTek proprietary intermediate result code Intermediate result code If enabled, an intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. **CONNECT**) is transmitted. **+CR: <serv>** **<serv>** GPRS[<**L2P**>] GPRS / Packet Switched connection <**L2P**> M-PT Packet Transport mechanism protocol for a PDP such as IP
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note <L2P> value M-PT is MTK proprietary and represents no <L2p> but raw IP packet transfer.

3.2.15 AT+CREG Network Registration

AT+CREG Network Registration	
Test Command **AT+CREG=?**	Response **+CREG: (**list of supported **<n>**s**)** **OK**
	Parameters See Write Command
Read Command	Response

AT+CREG?	TA returns the status of result code presentation and an integer <**stat**> which shows whether the network has currently indicated the registration of the ME. Location information elements <**lac**> and <**ci**> are returned only when <**n**>=2 and ME is registered in the network. **+CREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
Write Command **AT+CREG=<n>**	Response TA controls the presentation of an unsolicited result code **+CREG: <stat>** when <**n**>=1 and there is a change in the ME network registration status. **OK**
	Parameters **<n>** 0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code **+CREG:** <**stat**> 2 Enable network registration unsolicited result code with location information **+CREG: <stat>[,<lac>,<ci>[,<AcT>]]** <**stat**> 0 Not registered, MT is not currently searching a new operator to register to 1 Registered, home network 2 Not registered, but MT is currently searching a new operator to register to 3 Registration denied 4 Unknown 5 Registered, roaming 6 Registered for "SMS only", home network (applicable only when <**Act**> indicates NB-IOT 7 Registered for "SMS only", roaming (applicable only when <**Act**> indicates NB-IOT **<lac>** String type (string should be included in quotation marks); two byte location area code in hexadecimal format **<ci>** String type (string should be included in quotation marks); four byte cell ID in hexadecimal format <**AcT**> Access technology of the registered network 9 NB-IoT
	Unsolicited Result Code If <**n**>=1 and there is a change in the MT network registration status **+CREG: <stat>** If <**n**>=2 and there is a change in the MT network registration status or a change of the network cell:

	+CREG: <stat>[,<lac>,<ci>[,<AcT>]]
	Parameters See Write Command
Parameter Saving Mode	-
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.16 AT+CRSM Restricted SIM Access

AT+CRSM Restricted SIM Access	
Test Command **AT+CRSM=?**	Response **OK**
Write Command **AT+CRSM=<Command>[,<fileId>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]**	Response **+CRSM: <sw1>,<sw2>[,<response>]** **OK** **ERROR** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<Command>** 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS All other values are reserved; refer GSM 11.11. **<fileId>** Integer type; this is the identifier for an elementary data file on SIM. Mandatory for every command except STATUS **<P1>,<P2>,<P3>** Integer type, range 0-255 Parameters to be passed on by the ME to the SIM; refer GSM 11.11. **<data>** Information which shall be written to the SIM (hex-decimal character format) **<sw1>,<sw2>** Integer type, range 0-255 Status information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command;

	refer GSM 11.11. **<response>** Response of a successful completion of the command previously issued (hexadecimal character format) <**pathid**> String type; contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102.211 (e.g. "7F205F70" in SIM and UICC case). The <**pathid**> only used in the mode "select path from MF" as defined in ETSI TS 102.211.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 GSM 11.11	Note

3.2.17 AT+CSCS Select TE Character Set

AT+CSCS Select TE Character Set	
Test Command **AT+CSCS=?**	Response **+CSCS: (**list of supported <**chset**>s**)** **OK**
	Parameters **<chset>** Character type "GSM" GSM 7 bit default alphabet (3GPP TS 23.038); "UCS2" 16-bit universal multiple-octet coded character set (ISO/IEC10646); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99 "IRA" International reference alphabet (ITU-T T.50) "HEX" Character strings consist only of hexadecimal numbers from 00 to FF; "PCCP" PC character set Code "PCDN" PC Danish/Norwegian character set "8859-1" ISO 8859 Latin 1 character set
Read Command **AT+CSCS?**	Response **+CSCS: <chset>** **OK**
	Parameters See Test Command
Write Command	Response

AT+CSCS=<chset>	Sets which character set **<chset>** are used by the TE. The TA can then convert character strings correctly between the TE and ME character sets. **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Test Command
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.18 AT+CSQ Signal Quality Report

AT+CSQ Signal Quality Report	
Test Command **AT+CSQ=?**	Response **+CSQ: (**list of supported **<rssi>**s**),(**list of supported **<ber>**s**)** **OK**
Execution Command **AT+CSQ**	Response **+CSQ: <rssi>,<ber>** **OK** If error is related to ME functionality: **+CME ERROR: <err>** Execution Command returns received signal strength indication **<rssi>** and channel bit error rate **<ber>** from the ME. Test Command returns values supported by the TA.
	Parameters **<rssi>** Integer type. Rx signal strength level 0 -110 dBm or less 1 -109 dBm <=rssi<-107 dBm 2 -107 dBm <=rssi<-105 dBm 3…30 -105dBm <=rssi<-48 dBm 31 -48dBm <=rssi 99 Not known or not detectable **<ber>** (in percent): 0...7 As RXQUAL values in the table in GSM 05.08 [20] subclause 7.2.4 99 Not known or not detectable

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.19 AT+CMUX Multiplexer Control

AT+CMUX Multiplexer Control	
Test Command **AT+CMUX=?**	Response **+CMUX:** (list of supported <**mode**>s),(list of supported <**subset**>s),(list of supported<**port_speed**>s),(list of supported<**N1**>s),(list of supported<**T1**>s),(list of supported<**N2**>s),(list if supported<**T2**>s),(list of supported <**T3**>s),<list of supported <**k**>s) **OK**
	Parameters See Read Command
Read Command **AT+CMUX?**	Response: **+CMUX:** **[<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]** **OK** or **ERROR**
	Parameters **<mode>** 0 27.010 multiplexer **<subset>** The way in which the multiplexer control channel is set up 0 UIH frames used only **<port_speed>** Transmission rate 0 autobaud 1 110 2 300 3 1200 4 2400 5 4800 6 9600 7 19200 8 38400

	9 57600 10 115200 11 230400 12 460800 Proprietary values, available if MUX NEW PORT SPEED FTR is activated **<N1>** Maximum frame size 31-4096 (default value 31 for basic option) **<T1>** Acknowledgement timer in units of ten milliseconds 1-254 Default:10 (100 ms) **<N2>** Maximum number of re-transmissions 0-100 Default:3 **<T2>** Max Response Timer for the multiplexer control channel in units of ten milliseconds 2-255 Default:30 **<T3>** Wake up Max Response Timers in seconds 1-255 Default:10 **<k>** Window size, for Advanced operation with Error Recovery options 1-7 Default:2
Write Command **AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]**	Response If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<mode>** Multiplexer transparency mechanism 0 Basic option
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note ● The values of <**subset**>,<**port_speed**>,<**N1**>,<**T**>,<**N2**>,<**T2**>,<**T3**>,<**k**> are only relevent to the 27.010 MUX control channel. ● <**port_speed**> set to 0 will set the MUX port rate at whatever the AT+IPR setting is for the channel.

3.2.20 AT+CNUM Subscriber Number

AT+CNUM Subscriber Number	
Test Command **AT+CNUM=?**	Response **OK**
Execution	Response

Command **AT+CNUM**	**+CNUM:** **[<alpha1>],<number1>,<type1>[<CR><LF>+CNUM:[<alpha2>],<number2>,<type2>** **[...]]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**alpha*x***> Optional alphanumeric string associated with <**numberx**>; used character set should be the one selected with Command Select TE Character Set +CSCS. <**number*x***> String type (string should be included in quotation marks) phone number of format specified by <**type*x***>. <**type*x***> Type of address octet in integer format (refer GSM04.08[8] subclause 10.5.4.7)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.21 AT+CPOL Preferred Operator List

AT+CPOL Preferred Operator List	
Test Command **AT+CPOL=?**	Response **+CPOL: (**list of supported **<index>**s**),(**list of supported **<format>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CPOL?**	Response **+CPOL:** **<index1>,<format>,<oper1>[,<GSM_AcT1>,<GSMcomp_AcT1>,<UTRAN_AcT1>,<E-UTRAN_Act1][<CR><LF>+CPOL:** **<index2>,<format>,<oper2>[,<GSM_AcT2>,<GSMcomp_AcT2>,<UTRAN_AcT2,<E-UTRAN_AcT2>]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**

	Parameters See Write Command
Write Command **AT+CPOL=<index>[,<format>,<oper>]**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<index>** Integer type: order number of operator in SIM preferred operator list **<format>** Indicates whether alphanumeric or numeric format used (see +COPS Command) 0 Long format alphanumeric <**oper**> 1 Short format alphanumeric <**oper**> 2 Numeric <**oper**> **<oper>** String type(string should be included in quotation marks) <**GSM_AcTn**> GSM Access technology 0 Access technology not selected 1 Access technology selected <**GSM_Comp_AcTn**> GSM compact Access technology 0 Access technology not selected 1 Access technology selected <**UTRAN_AcTn**> UTRA Access technology 0 Access technology not selected 1 Access technology selected <**E-UTRAN_AcTn**> E-UTRAN Access technology 0 Access technology not selected 1 Access technology selected
Parameter Saving Mode	-
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note Not all USIMs support the preferred operator list.

3.2.22 AT+CFUN Set Phone Functionality

AT+CFUN Set Phone Functionality	
Test Command **AT+CFUN=?**	Response **+CFUN: (**list of supported <**fun**>s**),(**list of supported <**rst**>s**)** **OK** If error is related to ME functionality:

	+CME ERROR: <err>
	Parameters See Write Command
Read Command **AT+CFUN?**	Response **+CFUN: <fun>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CFUN=<fun>[,<rst>]**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<fun>** 0 Minimum functionality 1 Full functionality (Default) 4 Disable phone both transmit and receive RF circuits. 7 Disable phone SIM only. Transmit and receive circuits still active **<rst>** 0 Set it to <fun> power level now, but do not reset the MT 1 Do not set it to <fun> power level, either do not reset the MT before rebooting 2 Set it to <fun> power level now, and reset the MT after rebooting
Parameter Saving Mode	-
Max Response Time	10s
Reference 3GPP TS 27.007 [13]	Note

3.2.23 AT+CCLK Clock

AT+CCLK Clock	
Test Command **AT+CCLK=?**	Response **OK**
Read Command **AT+CCLK?**	Response **+CCLK: <time>**

	OK If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CCLK=<time>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<time>** String type, format is: yy/MM/dd,hh:mm:ss±zz, where characters indicate year (two last digits),month, day, hour, minutes, seconds and time zone. E.g. 10/05/06,00:01:52+08.
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note If MT does not support time zone information then the three last characters of <**time**> are not returned by +CCLK?.

3.2.24 AT+CSIM Generic SIM Access

AT+CSIM Generic SIM Access	
Test Command **AT+CSIM=?**	Response **OK**
Write Command **AT+CSIM=<length>,<Command>**	Response **+CSIM: <length>,<response>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<length>** Integer type: length of characters sent to the TE in <**Command**> or <**response**> (i.e. twice the number of octets in the raw data). **<Command>** String type (string should be included in quotation marks): hex format: GSM 11.11 SIM Command sent from the ME to the SIM. **<response>** String type(string should be included in quotation marks): hex format: GSM 11.11 response from SIM to <**Command**>.

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.25 AT+CBC Battery Charge

AT+CBC Battery Charge	
Test Command **AT+CBC=?**	Response **+CBC:** (list of supported <**bcl**>),(<**voltage**>) **OK**
	Parameters See Execution Command
Execution Command **AT+CBC**	Response **+CBC: <bcl>,<voltage>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<bcl>** Battery connection level 0...100 battery has 1-100 percent of capacity remaining vent **<voltage>** Battery voltage(mV)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.26 AT+CTZR Time Zone Reporting

AT+CTZR Time Zone Reporting	
Test Command **AT+CTZR=?**	Response **+CTZR: (**list of supported **<onoff>**s**)** **OK**
	Parameters

	See Write Command
Read Command **AT+CTZR?**	Response **+CTZR: <onoff>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CTZR=<onoff>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>** **Unsolicited result code:** **+CTZV: <zone>**
	Parameters <**onoff**> 0 Disable time zone event reporting 1 Enable time zone event reporting <**zone**> String type value; On behalf of the time zone, range -47...+48.The eastern region is denoted as "+32".
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.27 AT+CTZU Automatic Time Update

AT+CTZU Automatic Time Update	
Test Command **AT+CTZU=?**	Response **+CTZU: (**list of supported <**onoff**>s**)** **OK**
	Parameters See Write Command
Read Command **AT+CTZU?**	Response **+CTZU: <onoff>**

	OK If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CTZU=<onoff>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**onoff**> 0 Disable automatic time update via NITZ 1 Automatic time update via NITZ
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.28 AT+CPLS Selection of preferred PLMN List

AT+CPLS Selection of Preferred PLMN List	
Test Command **AT+CPLS=?**	Response **+CPLS: (**list of supported **<list>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CPLS?**	Response **+CPLS: <list>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CPLS=<list>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**

	Parameters **<list>** 0 User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNSel (this file is only on SIM card or GSM application in UICC. 1 Operator controlled PLMN selector with Access Technology EFOPLMNwAcT 2 HPLMN selector with Access Technology EFHPLMNwACT
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.29 AT+CPSMS Power Saving Mode Setting

AT+CPSMS Power Saving Mode Setting	
Test Command **AT+CPSMS=?**	Response **+CPSMS:** (list of supported <**mode**>s),(list of supported <**Requested_Periodic-RAU**>s),(list of supported <**Requested_GPRS-READY-timer**>s),(list of supported <**Requested_Periodic-TAU**>s),(list of supported <**Requested_Active-Time**>s) **OK**
	Parameters See Write Command
Read Command **AT+CPSMS?**	Response **+CPSMS:** **<mode>[,<Requested_Periodic-RAU>][,<Requested_GPRS-READY-timer>][,<Requested_Periodic-TAU>][,<Requested_Active-Time>]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CPSMS=[<mode>[,<Requested_Periodic-RA**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**

U>[,<Requested_GPRS-READY-timer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]	Parameters <**mode**> Integer type. Indication to disable or enable the use of PSM in the UE. 0 Disable the use of PSM 1 Enable the use of PSM 2 Disable the use of PSM and discard all parameters for PSM or, if available reset to the manufacturer specific default values. <**Requested_Periodic-RAU**> N/A for NB-IoT <**Requested_GPRS-READY-timer**> N/A for NB-IoT <**Requested_Periodic-TAU**> String type; one byte in an 8-bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401. The default value, if available, is manufacturer specific. <**Requested_Active-Time**> String type; one byte in an 8-bit format. Requested Active Time value (T3324) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682, 3GPP TS 23.060 and 3GPP TS 23.401. The default value, if available, is manufacturer specific.
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.30 AT+CCIOTOPT CIoT optimization configuration

AT+CCIOTOPT	**CIoT Optimization Configuration**
Test Command **AT+CCIOTOPT=?**	Response **+CCIOTOPT:** (list of supported <**n**>s),(list of supported <**supported_UE_opt**>s),(list of supported <**preferred_UE_opt**>s) **OK**
	Parameters See Write Command

Read Command **AT+CCIOTOPT?**	Response **+CCIOTOPT: <n>,<supported_UE_opt>,<preferred_UE_opt>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CCIOTOPT=[<n>[,<supported UE_opt>[,<preferred_UE_opt>]]]**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**n**> Integer type, enables or disables reporting of unsolicited result code +CCIOTOPTI. 0 Disable reporting. 1 Enable reporting. 2 Disable reporting and reset the parameters for CIoT EPS optimization to the default values. <**supported_UE_opt**> Integer type; indicates the UE's support for CIoT EPS optimizations. 1 Support for control plane CIoT EPS optimization. 3 Support for both control plane CIoT EPS optimization and user plane CIoT EPS optimization. <**preferred_UE_opt**> Integer type; indicates the UE's preference for CIoT EPS optimizations. 0 No preference 1 Preference for control plane CIoT EPS optimization 2 Preference for user plane CIoT EPS optimization
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.31 AT+CEDRXS eDRX Setting

AT+CEDRXS eDRX Setting	
Test Command **AT+CEDRXS=?**	Response **+CEDRXS:** (list of supported <**mode**>s),(list of supported <**AcT-type**>s),(list of supported <**Requested_eDRX_value**>s)

	OK
	Parameters See Write Command
Read Command **AT+CEDRXS?**	Response **[+CEDRXS:** **<AcT-type>,<Requested_eDRX_value>[<CR><LF>+CEDRXS:** **<AcT-type>,<Requested_eDRX_value>** **[...]]]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CEDRXS=** **<mode>[,<AcT-type>[,<Requested_eDRX_value>]]**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**mode**> Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>. 0 Disable the use of eDRX 1 Enable the use of eDRX 2 Enable the use of eDRX and enable the unsolicited result code **+CEDRXP:** **<AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]]** 3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values. <**AcT-type**> Integer type, indicates the type of access technology. This AT- command is used to specify the relationship between the type of access technology and the requested eDRX value. 5 E-UTRAN (NB-S1 mode) <**Requested_eDRX_value**> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific. <**NW-provided_eDRX_value**> String type; half a byte in a 4-bit

	format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub- clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. <**Paging_time_window**> String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.32 AT+CEDRXRDP eDRX Read Dynamic Parameters

AT+CEDRXRDP eDRX Read Dynamic Parameters	
Test Command **AT+CEDRXRDP=?**	Response **OK**
	Parameters See Execution Command
Execution Command **AT+CEDRXRDP**	Response **+CEDRXRDP:** **<AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**AcT-type**> Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value. 0 Access technology is not using eDRX 5 E-UTRAN (NB-S1 mode) <**Requested_eDRX_value**> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS

	24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. <**NW-provided_eDRX_value**> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. <**Paging_time_window**> String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.33 AT+CCHO Open UICC Logical Channel

AT+CCHO Open UICC Logical Channel	
Write Command **AT+CCHO=<dfname>**	Response **+CCHO: <sessionid>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**dfname**> String type in hexadecimal character format. All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes <**sessionid**> Integer type; a session Id to be used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	Note
3GPP TS 27.007 [13]	

3.2.34 AT+CCHC Close UICC logical channel

AT+CCHC Close UICC Logical Channel	
Write Command **AT+CCHC=<sessionid>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**sessionid**> Integer type; the session used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.35 AT+CGLA Generic UICC Logical Channel Access

AT+CGLA Generic UICC Logical Channel Access	
Write Command **AT+CGLA=<sessionid>,<length>,<command>**	Response **+CGLA: <length>,<response>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**sessionid**> Integer type; this is the identifier of the session used to send the APDU commands to the UICC. It is mandatory to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0"). <**length**> Integer type; length of the characters that are sent to TE in <**command**> or <**response**> (two times the actual length of the command or response) <**command**> Command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format) <**response**> Response to the command passed on by the UICC to the MT

	in the format as described in 3GPP TS 31.101 (hexadecimal character format)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.36 AT+CPINR Remaining PIN Retries

AT+CPINR Remaining PIN Retries	
Test Command **AT+CPINR=?**	Response **OK**
	Parameters See Write Command
Write Command **AT+CPINR[=<sel_code>]**	Response **[+CPINR: <code>,<retries>[,<default_retries>][<CR>,<LF>+CPINR: <code>,<retries>[,<default_retries>]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters <**sel_code**> String type. Same values as for the <code> parameter. These values are strings and shall be indicated within double quotes. Wildcard match by '*', meaning match any (sub-)string, or '?' meaning an character can be used. <**retries**> Integer type. Number of remaining retries per PIN. <**default_retries**> Integer type. Number of default/initial retries per PIN. <**code**> Type of PIN. All values listed under the description of the AT+CPIN Command, <**code**> parameter except **"READY"**.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	Note

3.2.37 AT+CGATT GPRS/Packet Domain Attach or Detach

AT+CGATT GPRS/Packet Domain Attach or Detach	
Test Command **AT+CGATT=?**	Response **+CGATT: (**list of supported **<state>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CGATT?**	Response **+CGATT: <state>** **OK**
	Parameters See Write Command
Write Command **AT+CGATT=<state>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<state>** Indicates the state of GPRS/Packet Domain attachment 0 Detached 1 Attached Other values are reserved and will result in an ERROR response to the Write Command.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

3.2.38 AT+CGDCONT Define PDP Context

AT+CGDCONT Define PDP Context	
Test Command **AT+CGDCONT=?**	Response **+CGDCONT: (**range of supported **<cid>**s**),<PDP_type>,,,(**list of supported **<d_comp>**s**),(**list of supported **<h_comp>**s**),(**list of supported **<IPv4AddrAlloc>**s**),(**list of supported **<request_type>**s**),(**list of supported **<P-CSCF_discovery>**s**),(**list of supported **<IM_CN_Signalling_Flag_Ind>**s**),(**list of supported **<NSLPI>**s**),(**list of supported **<securePCO>**s**),(**list of supported **<IPv4_MTU_discovery>**s**),(**list of supported **<Local_Addr_Ind>**s**),(**list of

	supported <**Non-IPMTUdiscovery**>s) **[<CR><LF>+CGDCONT: (**range of supported **<cid>**s)**,<PDP_type>**,,,(**list of supported **<d_comp>**s)**,(**list of supported **<h_comp>**s)**,(**list of supported **<IPv4AddrAlloc>**s)**,(**list of supported **<request_type>**s)**,(**list of supported **<P-CSCF_discovery>**s)**,(**list of supported **<IM_CN_Signalling_Flag_Ind>**s)**,(**list of supported **<NSLPI>**s)**,(**list of supported **<securePCO>**s)**,(**list of supported **<IPv4_MTU_discovery>**s)**,(**list of supported **<Local_Addr_Ind>**s)**,,(**list of supported **<Non-IP_MTU_discovery>**s)**[...]]** **OK**
	Parameters See Write Command
Read Command **AT+CGDCONT?**	Response **+CGDCONT:** **<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>]]]]]]]]]** **[<CR><LF>** **+CGDCONT:** **<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>]]]]]]]]]** **OK**
	Parameters See Write Command
Write Command **AT+CGDCONT=<cid>[,<PDP_type>[,APN>[,<PDP_addr>[,<d_comp>[,<h_comp>]]]]**	Response **OK** or **ERROR**
	Parameters **<cid>** (PDP Context Identifier) a numeric parameter that specifies a particular PDP context definition. The parameter is local to the UE-TE interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1 or if the initial PDP context is supported minimum value=0) is returned by the test form of the command. **<PDP_type>** (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol:

	IP Internet Protocol (IETF STD 5) IPV6 Internet Protocol, version 6 (IETF RFC 2460) IPV4V6 Virtual <PDP_type>) introduced to handle dual IP stack UE capability (see 3GPP Technical Specifications 24.301). Non-IP Transfer of Non-IP data to external packet data Network (see 3GPP Technical Specifications 24.301). **<APN>** (Access Point Name) a string parameter, a logical name to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. **<PDP_addr>** A string parameter that identifies the UE in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command. NOTE: For EPS, this field is omitted. **<d_comp>** A numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 04.65) 0 off (default if value is omitted) 1 on (manufacturer preferred compression) 2 V.42bis Other values are reserved. **<h_comp>** A numeric parameter that controls PDP header compression (refer 3GPP TS 04.65) 0 off (default if value is omitted) 1 on (manufacturer preferred compression) 2 RFC1144 (applicable for SNDCP only) 3 RFC 2507 4 RFC 3095 (ROHC) (applicable for PDCP only) Other values are reserved. **<IPv4_MTU_discovery>** Integer type; influences how the MT/TA requests to get the IPv4 MTU size, see 3GPP TS 24.008 sub-clause 10.5.6.3. 0 Preference of IPv4 MTU size discovery not influenced by +CGDCONT 1 Preference of IPv4 MTU size discovery through NAS signaling **<Non-IP_MTU_discovery>** Integer type; influences how the MT/TA requests to get the Non-IP MTU size, see 3GPP TS 24.008 sub-clause 10.5.6.3. 0 Preference of Non-IP MTU size discovery not influenced by +CGDCONT 1 Preference of Non-IP MTU size discovery through NAS signaling
Parameter Saving	NO_SAVE

Mode	
Max Response Time	-
Reference	Note

3.2.39 AT+CGACT PDP Context Activate or Deactivate

AT+CGACT PDP Context Activate or Deactivate	
Test Command **AT+CGACT=?**	Response **+CGACT: (**list of supported **<state>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CGACT?**	Response **+CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>…]** **OK**
	Parameters See Write Command
Write Command **AT+CGACT=<state>[,<cid>]**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<state>** Indicates the state of PDP context activation 0 Deactivated 1 Activated Other values are reserved and will result in an ERROR response to the Write Command. **<cid>** A numeric parameter which specifies a particular PDP context definition (see +CGDCONT Command). If the <cid> is omitted, it only affects the first cid.
Parameter Saving Mode	NO_SAVE
Max Response Time	150 seconds
Reference	Note If context is deactivated successfully, NO CARRIER is returned If **<cid>=0** for PDN activated during attach is enabled, then AT+CGACT=<0> or <1>, 0 will cause **ERROR** response.

3.2.40 AT+CGPADDR Show PDP Address

AT+CGPADDR	Show PDP Address
Test Command **AT+CGPADDR=?**	Response **+CGPADDR: (**list of defined **<cid>**s**)** **OK** or **OK**
	Parameters See Write Command
Write Command **AT+CGPADDR=[<cid>[,<cid>[,…]]]**	Response **+CGPADDR: <cid>[,<PDP_addr>][<CR><LF>+CGPADDR: <cid>[,<PDP_addr>][…]]** **OK** or **OK** or **ERROR**
	Parameters **<cid>** A numeric parameter which specifies a particular PDP context definition (see +CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned. **<PDP_addr>** A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address, it will be the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**. **<PDP_address>** is omitted if none is available.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note Write command returns address provided by the network if a connection has been established.

3.2.41 AT+IPCONFIG Show the Complete PDP Address

AT+IPCONFIG	Show the Complete PDP Address
Execution	Response

Command **AT+IPCONFIG**	**+IPCONFIG: <PDP_addr>** **[+IPCONFIG: <PDP_addr>]** **OK**
	Parameters **<PDP_addr>** A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note Write command returns address provided by the network if a connection has been established.

3.2.42 AT+CGEREP Packet Domain Event Reporting

AT+CGEREP Packet Domain Event Reporting	
Test Command **AT+CGEREP=?**	Response **+CGEREP: (**list of supported **<mode>**s**),(**list of supported **<bfr>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CGEREP?**	Response **+CGEREP: <mode>,<bfr>** **OK**
	Parameters See Write Command
Write Command **AT+CGEREP=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** 0 buffer unsolicited result codes in the UE; if UE result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 discard unsolicited result codes when UE-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 buffer unsolicited result codes in the UE when UE-TE link is

	reserved (e.g. in on-line data mode) and flush them to the TE when UE-TE link becomes available; otherwise forward them directly to the TE **<bfr>** 0 UE buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered 1 UE buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)
	Unsolicited Result Codes supported: **For network attachment, the following unsolicited result codes and the corresponding events are defined:** **+CGEV: NW DETACH** The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. **+CGEV: ME DETACH** The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. **For PDP context activation, the following unsolicited result codes and the corresponding events are defined:** **+CGEV: NW PDN ACT <cid>** The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. NOTE 1: This event is not applicable for EPS. **+CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]]** The mobile termination has activated a context. The context represents a PDN connection in NB-IOT. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameter <cid> and <cid other> are found in command +CGDCONT. **For PDP context deactivation, the following unsolicited result codes and the corresponding events are defined:** **+CGEV: NW PDN DEACT <cid>** The network has deactivated a context. The context represents a PDN connection in NB-IOT. The associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. NOTE 2: Occurrence of this event replaces usage of the event **+CGEV: NW DEACT <PDP_type>,<PDP_addr>,[<cid>]** **+CGEV: ME PDN DEACT <cid>** The mobile termination has deactivated a context. The context represents a

	PDN connection in NB-IOT. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. NOTE 3: Occurrence of this event replaces usage of the event **+CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>]** **For other PDP context handling, the following unsolicited result codes and the corresponding events are defined:** **+CGEV: REJECT <PDP_type>,<PDP_addr>** A network request for context activation occurred when the UE was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP_type> and <PDP_addr> are found in command +CGDCONT. NOTE 6: This event is not applicable for EPS. **+CGEV: NW REACT <PDP_type>,<PDP_addr>,[<cid>]** The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the UE. The format of the parameters <PDP_type>,<PDP_addr> and <cid> are found in command +CGDCONT. NOTE 7: This event is not applicable for EPS.
	Parameters **<PDP_addr>** Packet Data Protocol address (see +CGDCONT command} **<cid>** Context Id (see +CGDCONT command) Note: <cid> only given if known to the UE. **<class>** GPRS mobile class (see +CGCLASS command) **<event_type>** Integer type parameter indicates whether this is an informational event of whether the TE as acknowledged it. 0 Informational event 1 Information request: Acknowledgement required. The Acknowledgement can be accept or reject, see AT+CGANS. **<change_reason>** Integer type parameter indicates what kind of change occurred. 1 TFT only changed 2 QoS only changed 3 Both TFT and QoS changed **<reason>** Integer type parameter indicates the reason why the context activation request for PDP type IPV4V6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is IPV4V6, and the PDP type assign by the network for <cid> is either IPV4 or IPV6 0 IPV4 only allowed 1 IPV6 only allowed 2 single address bearers only allowed 3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful **<cid_other>** Indicated the context identifier allocated by MT for an MT

	initiated context of a second address type. MT shall only include this parameter if <**reason**> parameter indicates single address bearers only allowed, and MT support MT initiated context activation of a second address type without additional commands from the TE, and MT has activated the PDN connection or PDP context associated with <**cid_other**>.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

3.2.43 AT+CGREG Network Registration Status

AT+CGREG Network Registration Status	
Test Command **AT+CGREG=?**	Response **+CGREG: (**list of supported **<n>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CGREG?**	Response **+CGREG: <n>,<stat>[,<lac>,<ci>,<AcT>,<rac>]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CGREG=<n>**	Response **OK** or **ERROR**
	Parameters **<n>** 0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code **+CGREG: <stat>** 2 Enable network registration and location information unsolicited result code **+CGREG: <stat>[,<lac>,<ci>,<AcT>,<rac>]** **<stat>** 0 Not registered, MT is not currently searching an operator to register to.

	1 Registered, home network. 2 Not registered, but MT is currently trying to attach or searching an operator to register to. 3 Registration denied. 4 Unknown 5 Registered, roaming 6 Registered for "SMS only", home network (applicable only when <Act> indicates E-UTRAN) 7 Registered for "SMS only", roaming (applicable only when <Act> indicates E-UTRAN) **<lac>** String type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) **<ci>** String type; four byte UTRAN/GERAN/E-UTRAN cell ID in hexadecimal format **<AcT>** Access technology of the registered network 9 NB-IoT **<rac>** String type; one byte routing area code in hexadecimal format
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

3.2.44 AT+CGCONTRDP PDP Context Read Dynamic Parameters

AT+CGCONTRDP PDP Context Read Dynamic Parameters	
Test Command **AT+CGCONTRDP=?**	Response **+CGCONTRDP: (**list of **<cid>**s associated with active contexts**)** **OK** or **OK**
	Parameters See Write Command
Write Command **AT+CGCONTRDP=[<cid>]**	Response **+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local address and subnet mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P_CSCF_prim_addr>[,<P_CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>[,<IPv4_MTU>[,<WLAN_Offload>[,<Local_Addr_Ind>[,<Non-IP_MTU>[,<Serving_PLMN_rate_control_value>]]]]]]]]]]]]]]** **[<CR><LF>+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local address and subnet mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P_CSCF**

	_prim_addr>[,<P_CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>[,<IPv4_MTU>[,<WLAN_Offload>[,<Local_Addr_Ind>[,<Non-IP_MTU>[,<Serving_PLMN_rate_control_value>]]]]]]]]]] **[…]]** **OK** or **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<cid>** A numeric parameter which specifies a particular primary PDP context definition. The parameter is local to the TE-UE interface and is used in other PDP context-related commands. **<bearer_id>** A numeric parameter which identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS. **<APN>** A string parameter which is a logical name that was used to select the GGSN or the external packet data network. **<local address and subnet mask>** A string parameter which shows the IP Address and subnet mask of the UE. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6. **<gw_addr>** A string parameter which shows the Gateway Address of the UE. The string is given as dot-separated numeric (0-255) parameters. **<DNS_prim_addr>** A string parameter which shows the IP Address of the primary DNS Server. **<DNS_sec_addr>** A string parameter which shows the IP address of the secondary DNS Server. **<IPv4_MTU>** Integer type;show the IPv4 MTU size in octets. **<Non-IP_MTU>** Integer type; show the Non-IP MTU size in octets. **<Serving_PLMN_rate_control_value>** Integer type; indicates the maximum number of uplink messages the UE is allowed to send in a 6-minute interval. This refers to octet 3 to 4 of the Serving PLMN rate control IE as specified in 3GPP TS 24.301 sub-clause 9.9.4.28.
Parameter Saving Mode	-
Max Response Time	-
Reference	Note Parameters **<P_CSCF_prim_addr>,<P_CSCF_sec_addr>,<IM_CN_Signalling_Fla**

	g>,<LIPA_indication>,<WLAN_Offload>,<Local_Addr_Ind> are not displayed for MTK NB-IOT solution.

3.2.45 AT+CGPIAF Printing IP Address Format

AT+CGPIAF Printing IP Address Format	
Test Command **AT+CGPIAF=?**	Response **+CGPIAF: (**list of supported **<IPv6_AddressFormat>**s**),(**list of supported **<IPv6_SubnetNotation>**s**),(**list of supported **<IPv6_LeadingZeros>**s**),(**list of supported **<IPv6_CompressZeros>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CGPIAF?**	Response **+CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros>** **OK** or **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CGPIAF=[IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros>[,<IPv6_CompressZeros>]]]]**	Response OK If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<IPv6_AddressFormat>** Integer type, decides the IPV6 address format. Relevant for all AT command parameters that can hold an IPV6 address. 0 Use IPV4-like dot-notation. IP address, and Subnetwork mask if applicable, are dot-separated. Example: For <**source address and subnet mask**>: "32.1.13.184.0.0.205.48.0.0.0.0.0.0.0.0.255.255.255.255.255.255.255.240.0.0.0.0.0.0.0.0" For other IP address parameters: "32.1.13.184.0.0.205.48.0.0.0.0.0.0.0.0" 1 Use IPV6-like colon notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space. Example: For <**source address and subnet mask**>:

	"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF:FFFF:FFFF:FFF0:0000:0000:0000:0000" For other IP address parameters: "2001:0DB8:0000:CD80:0000:0000:0000:0000" **<IPv6_SubnetNotation>** Integer type, decides the subnet-notation for <source Address and subnet mask>. Setting does not apply If <IPVv6_AddressFormat>=0. 0 Both IP Address and subnet mask are stated.Explicitly, separated by a space. (Example: "2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF:FFFF:FFFF:FFF0:0000:0000:0000:0000") 1 The printout format is applying / (forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation. (Example: "2001:0DB8:0000:CD30:0000:0000:0000:0000/60") **<IVv6_LeadingZeros>** Integer type, decides whether leading zeros are Omitted or not. Setting does not apply if <IPv6_AddressFormat>=0. 0 Leading zeros are omitted. (Example: "2001:DB8:0:CD30:0:0:0:0") 1 Leading zeros are included. (Example: "2001:0DB8:0000:CD30:0000:0000:0000:0000") **<IPv6_CompressZeros>** Integer type, decides whether 1-n instances of 16 bit zero-values are replaced by only "..". This applies only once. Setting does not apply if <IPv6_AddressFormat>=0. 0 No zero compression. (Example: "2001:DB8:0:CD30:0:0:0:0") 1 Use zero compression. (Example: "2001:DB8:0:CD30::")
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

3.2.46 AT+CGDEL Delete Non-Active PDP Contexts

AT+CGDEL Delete Non-Active PDP Contexts	
Test Command **AT+CGDEL=?**	Response **OK**
	Parameters See Write Command
Write Command **AT+CGDEL=[<cid>]**	Response **+CGDEL: <cid>[,<cid>[,…]]** **OK**

	If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<cid>** A numeric parameter which specifies a particular PDP context definition.
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

3.2.47 AT+CGAUTH Define PDP Context Authentication Parameters

AT+CGAUTH Define PDP Context Authentication Parameters	
Test Command **AT+CGAUTH=?**	Response **+CGAUTH: (**range of supported **<cid>**s**),(**list of supported **<auth_prot>**s**),(**range of supported **<userid>**s**),(**range of supported **<password>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CGAUTH?**	Response **[+CGAUTH: <cid>,<auth_prot>,<userid>,<password>][<CR><LF>+CGAUTH: <cid>,<auth_prot>,<userid>,<password>** **[…]]** **OK**
	Parameters See Write Command
Write Command **AT+CGAUTH=<cid>[,<auth_prot>[,<userid>[,<password>]]]**	Response When <auth_prot>/<username>/<password> set: **OK** When no <auth_prot>/<username>/<password> set displays current auth_prot username and password for <cid>: **+CGAUTH: <cid>,<auth_prot>,<username>,<password>** **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<cid>** A numeric parameter which specifies a particular PDP context

	definition (see the +CGDCONT and +CGDSCONT commands). **<auth_prot>** Numeric parameter. Authentication protocol used for this PDP context. 0 None. Used to indicate that no authentication protocol is used for this PDP context. Username and password are removed if previously specified. 1 PAP **<userid>** String type. User name for access to the IP network. **<password>** String type. Password for access to the IP network.
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

3.2.48 AT*MCGDEFCONT Set Default PSD Connection Settings

AT*MCGDEFCONT Set Default PSD Connection Settings	
Test Command **AT*MCGDEFCONT**=?	Response ***MCGDEFCONT: (**list of supported **<PDP_type>)** **OK**
	Parameters See Write Command
Read Command **AT*MCGDEFCONT**?	Response ***MCGDEFCONT: <PDP_type>[,<APN>,<username>,<password>]** **OK**
	Parameters See Write Command
Write Command **AT*MCGDEFCONT=<PDP_type>[,<APN>[,<username>[,<password>]]]**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<PDP_type>** (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol: IP Internet Protocol (IETF STD 5) IPV6 Internet Protocol, version 6 (IETF RFC 2460) IPV4V6 Virtual <PDP_type) introduced to handle dual IP stack UE capability(see 3GPP TS 24.301). Non-IP Transfer of Non-IP data to external packet data Network (see 3GPP TS 24.301).

	<APN> (Access Point Name) a string parameter that is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. **<username>** String value. Username for the connection to the service provider. **<password>** String value. Password for the connection to the service provider
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	Note

3.2.49 AT+CEREG EPS Network Registration Status

AT+CEREG EPS Network Registration Status	
Test Command **AT+CEREG=?**	Response **+CEREG: (**list of supported **<n>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CEREG?**	Response when **<n>**=0, 1, 2 or 3 and command successful: **+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>[,<cause_type>,<reject_cause>]]]** when **<n>**=4 or 5 and command successful: **+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]** If error is related to wrong AT syntax or operation not allowed: **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CEREG=<n>**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<n>**

0 Disable network registration unsolicited result code

1 Enable network registration unsolicited result code
+CEREG: <stat>

2 Enable network registration and location information unsolicited result code **+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]]**

3 Enable network registration, location information and EMM cause value information unsolicited result code
+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

4 For a UE that wants to apply PSM, enable network registration and location information unsolicited result code
+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]]

5 For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code
+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]

<stat> EPS registration status

0 Not registered, ME is not currently searching a new operator to register to

1 Registered, home network

2 Not registered, but ME is currently searching for a new operator to register to

3 Registration denied

4 Unknown

5 Registered, roaming

6 Registered for "SMS only", home network (applicable only when <Act> indicates NB-IOT

7 Registered for "SMS only", roaming (applicable only when <Act> indicates NB-IOT

100 Network has been found but attach is pended,ME is waiting for AT+CGATT=1 to perform attach procedure

<tac> String type; two byte tracking area code in hex adecimal format (e.g. "00C3" equals 195 in decimal).

<ci> String type; four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format

<AcT> Access technology of the registered network

9 NB-IoT

<cause_type> Integer type; indicates the type of <reject_cause>

0 Indicates that <reject_cause> contains an EMM cause value, see 3GPP TS 24.301 Annex A.

1 Indicates that <reject_cause> contains a manufacturer-specific cause.

	<reject_cause> Integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>. **<Active-Time>** String type; one byte in an 8-bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401. **<Periodic-TAU>** String type; one byte in an 8-bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008, Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note For NB-IoT product, only <**AcT**> value of 9 is valid.

3.2.50 AT+CGDATA Enter Data State

AT+CGDATA Enter Data State	
Test Command **AT+CGDATA=?**	Response **+CGDATA: (**list of supported **<L2P>**s**)** **OK**
	Parameters See Write Command
Write Command **AT+CGDATA=[<L2P>[,<cid>[,<cid>[,...]]]]**	Response **OK** or **ERROR**
	Parameters **<L2P>** A string parameter that indicates the layer 2 protocol to be used between the TE and MT. M-PT Packet Transport Mechanism protocol for a PDP such as IP Other values are not supported and will result in an ERROR response to the write command.

	<cid> A numeric parameter which specifies a particular PDP context definition (see +CGDCONT command).
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note The command will enter data state once the PDP context has been activated <**L2P**> value M-PT is MTK proprietary and represents no <**L2P**> but raw IP packet transfer.

4 AT Commands According to 3GPP TS 27.005

The 3GPP TS 27.005 commands are for performing SMS and CBS related operations for both Text and PDU modes.

4.1 Overview of AT Commands According to 3GPP TS 27.005

Command	Description
AT+CMGD	Delete SMS message
AT+CMGF	Select SMS message format
AT+CMGL	List SMS messages from preferred store
AT+CMGR	Read SMS message
AT+CMGS	Send SMS message
AT+CMGW	Write SMS message to memory
AT+CMSS	Send SMS message from storage
AT+CMGC	Send SMS Command
AT+CNMI	New SMS message indications
AT+CPMS	Preferred SMS message storage
AT+CRES	Restore SMS settings
AT+CSAS	Save SMS settings
AT+CSCA	SMS service center address
AT+CSDH	Show SMS text mode parameters
AT+CSMP	Set SMS text mode parameters
AT+CSMS	Select message service
AT+CNMA	New SMS Message Acknowledgment
AT+CMMS	More SMS Messages to Send

4.2 Detailed Descriptions of AT Commands According to 3GPP TS 27.005

4.2.1 AT+CMGD Delete SMS Message

AT+CMGD Delete SMS Message	
Test Command **AT+CMGD=?**	Response **+CMGD: (**list of supported **<index>**s**)** **OK**
	Parameters See Write Command

Write Command **AT+CMGD=<index>[,<delflag>]**	Response TA deletes message from preferred message storage <**mem1**> location <**index**>. **OK** or **ERROR** If error is related to ME functionality: **+CMS ERROR: <err>**
	Parameters **<index>** Integer type; value in the range of location numbers supported by the associated memory,This value is only used if <DelFlag>=0. **<delflag>** 0 Delete message at location <index> (Default value) 1 Delete all read messages 2 Delete all READ and SENT messages 3 Delete all READ, SENT and UNSENT messages 4 Delete all messages
Parameter Saving Mode	NO_SAVE
Max Response Time	5s（delete 1 message） 25s（delete 50 messages） 25s（delete 150 messages）
Reference 3GPP TS 27.005	Note ● When the MT2625 software has concatenated SMS handling in modem enabled (see AT command AT*MFTRCFG) the user can delete a concatenated text SMS up to 1024 characters in length. A concatenated SMS is stored on the SIM as number of smaller SMSs. (This is not possible when MMI is present). ● When the MT2625 software does not have concatenated SMS handling in the modem enabled, the maximum text SMS length is restricted depending on the data coding scheme (160 for 7-bit, 140 for 8-bit, 80 for 16-bit). ● An attempt to delete anything other than the first segment of a concatenated SMS, when concat SMS is enabled, will result in ERROR response. ● Deleting an empty entry will result in OK response rather than ERROR.

4.2.2 AT+CMGF Select SMS Message Format

AT+CMGF Select SMS Message Format	
Test Command **AT+CMGF=?**	Response **+CMGF: (**list of supported **<mode>**s**)**

	OK
	Parameter See Write Command
Read Command **AT+CMGF?**	Response **+CMGF: <mode>** **OK**
	Parameter See Write Command
Write Command **AT+CMGF=[<mode>]**	Response TA sets parameter to denote which input and output format of messages to use. **OK**
	Parameter **<mode>** 0 PDU mode 1 Text mode
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note

4.2.3 AT+CMGL List SMS Messages from Preferred Store

AT+CMGL List SMS Messages from Preferred Store	
Test Command **AT+CMGL=?**	Response **+CMGL: (**list of supported **<stat>**s**)** **OK**
	Parameter See Write Command
Write Command **AT+CMGL=<stat>**	Parameters 1) If text mode: **<stat>** "REC UNREAD" Received unread messages "REC READ" Received read messages "STO UNSENT" Stored unsent messages "STO SENT" Stored sent messages "ALL" All messages

	2) If PDU mode: **<stat>** 0 Received unread messages 1 Received read messages 2 Stored unsent messages 3 Stored sent messages 4 All messages
	Response TA returns messages with status value <**stat**> from message storage <**mem1**> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'. 1) If text mode (**+CMGF=1**) and Command successful: for SMS-SUBMITs and/or SMS-DELIVERs: **+CMGL:** **<index>,<stat>,<oa/da>[,<alpha>][,<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF>+CMGL:** **<index>,<stat>,<da/oa>[,<alpha>][,<scts>][,<tooa/toda>,<length>]<CR><LF><data>[...]]** **OK** If SMS-STATUS-REPORT and text mode: **+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF>+CMGL:** **<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> [...]]** **OK** 2) If PDU mode (**+CMGF=0**) and Command successful: **+CMGL:** **<index>,<stat>[,<alpha>],<length><CR><LF><pdu><CR><LF>+CMGL: <index>,<stat>[,alpha],<length><CR><LF><pdu>[...]]** **OK** 3)If error is related to ME functionality: **+CMS ERROR: <err>**
	Parameters <**alpha**> String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific <**da**> 3GPP 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <toda> <**data**> In the case of SMS: 3GPP 23.040 TP-User-Data in text mode responses; format:

	if <dcs> indicates that 3GPP 23.038 default alphabet is used and <fo> indicates that 3GPP 23.040 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that 3GPP 23.040 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) In the case of CBS: 3GPP 23.041 CBM Content of Message in text mode responses; format: if <dcs> indicates that 3GPP 23.038 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A. if <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number. <**length**> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) <**index**> Integer type; value in the range of location numbers supported by the associated memory <**oa**> 3GPP 23.040 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <tooa> <**pdu**> In the case of SMS: 3GPP 24.011 SC address followed by 3GPP 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: 3GPP 23.041 TPDU in hexadecimal format. <**scts**> 3GPP 23.040 TP-Service-Center-Time-Stamp in time-string format (refer <dt>) <**toda**> 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <**tooa**> 3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer<toda>)
Execution Command **AT+CMGL**	1) If text mode: the same as AT+CMGL="REC UNREAD",received unread messages. 2) If PDU mode: the same as AT+CMGL=0, received unread messages. See more messages please refer to Write Command.

	Parameters See Write Command
Parameter Saving Mode	NO_SAVE
Max Response Time	20s(list 50 messages) 20s(list 150 messages)
Reference 3GPP TS 27.005	Note

4.2.4 AT+CMGR Read SMS Message

AT+CMGR Read SMS Message	
Test Command **AT+CMGR=?**	Response **OK**
Write Command **AT+CMGR=<index>**	Parameters **<index>** Integer type; value in the range of location numbers supported by the associated memory
	Response TA returns SMS message with location value <index> from message storage <mem1> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'. If text mode (+CMGF=1) and command successful: for SMS-DELIVER: **+CMGR:** **<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>** **OK** for SMS-SUBMIT: **+CMGR:** **<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>** **OK** If SMS-STATUS-REPORT and text mode: **+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **OK** If PDU mode (+CMGF=0) and command successful: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>** **OK**

	If error is related to ME functionality: **+CMS ERROR: <err>**
	Parameters <**alpha**> String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific. <**da**> 3GPP 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS); type of address given by <toda> <**data**> In the case of SMS: 3GPP 23.040 TP-User-Data in text mode responses; format: If <dcs> indicates that 3GPP 23.038 default alphabet is used and <fo> indicates that 3GPP 23.040 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that 3GPP 23.040 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: 3GPP 23.041 CBM Content of Message in text mode responses; format: If <dcs> indicates that 3GPP 23.038 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A If <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number <**dcs**> Depending on the command or result code: 3GPP 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format. <**fo**> Depending on the command or result code: first octet of 3GPP 23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format <**length**> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) <**mid**> 3GPP 23.041 CBM Message Identifier in integer format <**oa**> 3GPP 23.040 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted characters of the currently selected TE character set (specified by

	+CSCS);; type of address given by <tooa>. <**pdu**> In the case of SMS: 3GPP 24.011 SC address followed by 3GPP 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: 3GPP 23.041 TPDU in hexadecimal format. <**sca**> 3GPP 24.011 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS); type of address given by <tosca> <**scts**> 3GPP 23.040 TP-Service-Centre-Time-Stamp in time-string format (refer <dt>) <**stat**> 0 "REC UNREAD" Received unread messages 1 "REC READ" Received read messages 2 "STO UNSENT" Stored unsent messages 3 "STO SENT" Stored sent messages 4 "ALL" All messages <**toda**> 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129) <**tooa**> 3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer<toda>) <**tosca**> 3GPP 24.011 RP SC address Type-of-Address octet in integer format (default refer <toda>) <**vp**> Depending on SMS-SUBMIT <fo> setting: 3GPP 23.040 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>) <**mr**> Message reference. Integer format. <**ra**> Recipient address. String type. <**tora**> Type of address of <ra>. 145 International number 129 National number <**dt**> Discharge time. String format: "yy/MM/dd,hh:mm:ss+/-zz" (Year/Month/Dat,Hour:Seconds+/TimeZone) <**st**> Status of an SMS-STATUS-REPORT. Integer format.
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference 3GPP TS 27.005	Note

4.2.5 AT+CMGS Send SMS Message

AT+CMGS Send SMS Message	
Test Command **AT+CMGS=?**	Response **OK**
Write Command 1) If text mode (+CMGF=1): **+CMGS=<da>[,<toda>]** **<CR>text is entered** **<ctrl-Z/ESC>** ESC quits without sending 2) If PDU mode (+CMGF=0): **+CMGS=<length>** **<CR>PDU is given** **<ctrl-Z/ESC>**	Parameters **<da>** 3GPP 23.040 TP-Destination-Address Address-Value field in string format;BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by **+CSCS**); type of address given by **<toda>** **<toda>** 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of **<da>** is + (IRA 43) default is 145, otherwise default is 129) **<length>** Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)
	Response TA sends message from a TE to the network (SMS-SUBMIT). Message reference value <**mr**> is returned to the TE on successful message delivery. Optionally (when **+CSMS <service>** value is 1 and network supports) <**scts**> is returned. Values can be used to identify message upon unsolicited delivery status report result code. 1) If text mode(+CMGF=1) and sending successful: **+CMGS: <mr>** **OK** 2) If PDU mode(+CMGF=0) and sending successful: **+CMGS: <mr>** **OK** 3)If error is related to ME functionality: **+CMS ERROR: <err>**
	Parameter **<mr>** 3GPP 23.040 TP-Message-Reference in integer format
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
Reference 3GPP TS 27.005	Note

4.2.6 AT+CMGW Write SMS Message to Memory

AT+CMGW Write SMS Message to Memory	
Test Command **AT+CMGW=?**	Response **OK**
Write Command 1) If text mode (+CMGF=1): **AT+CMGW=<oa/da>[,<tooa/toda>][,<stat>]** <CR> **text is entered** **<ctrl-Z/ESC>** <ESC> quits without sending	Response TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage <**mem2**>. Memory location <**index**> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <**stat**> allows also other status values to be given. If writing is successful: **+CMGW: <index>** **OK** If error is related to ME functionality: **+CMS ERROR: <err>**
2) If PDU mode (+CMGF=0): **AT+CMGW=<length>[,<stat>]** **<CR>PDU is given** **<ctrl-Z/ESC>**	Parameters **<oa>** 3GPP 23.040 TP-Originating-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS);type of address given by <**tooa**> **<da>** 3GPP 23.040 TP-Destination-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by **+CSCS**); type of address given by <**toda**> **<tooa>** 3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer <**toda**>) **<toda>** 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of **<da>** is + (IRA 43) default is 145, otherwise default is 129) **<length>** Integer type value indicating in the text mode (**+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters; or in PDU mode (**+CMGF=0**), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) **<pdu>** In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format. **<index>** Index of message in selected storage <**mem2**>

Execution Command **AT+CMGW**	Response TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage <**mem2**>. Memory location <**index**> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <**stat**> allows also other status values to be given. If writing is successful: **+CMGW: <index>** **OK** If error is related to ME functionality: **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference 3GPP TS 27.005	Note

4.2.7 AT+CMSS Send SMS Message from Storage

AT+CMSS Send SMS Message from Storage	
Test Command **AT+CMSS=?**	Response **OK**
Write Command **AT+CMSS=<index>[,<da>,<toda>]**	Response TA sends message with location value <**index**> from message storage <**mem2**> to the network (SMS-SUBMIT). If new recipient address <**da**> is given, it shall be used instead of the one stored with the message. Reference value <**mr**> is returned to the TE on successful message delivery. Values can be used to identify message upon unsolicited delivery status report result code. 1) If text mode(**+CMGF=1**) and sending successful: **+CMSS: <mr>** **OK** 2) If PDU mode(**+CMGF=0**) and sending successful: **+CMSS: <mr>** **OK** 3)If error is related to ME functionality: **+CMS ERROR: <err>**
	Parameters **<index>** Integer type; value in the range of location numbers supported by

	the associated memory **<da>** 3GPP 23.040 TP-Destination-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by **+CSCS** in 3GPP TS 27.007); type of address given by <**toda**> **<toda>** 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <**da**> is + (IRA 43) default is 145, otherwise default is 129) **<mr>** 3GPP 23.040 TP-Message-Reference in integer format
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
Reference 3GPP TS 27.005	Note

4.2.8 AT+CMGC Send SMS Command

AT+CMGC Send SMS Command	
Test Command **AT+CMGC=?**	Response **OK**
Execute command 1) If text mode (+CMGF=1): **AT+CMGC=<fo>,<ct>[<pid>[,<mn>[,<da>[,<toda>]]]]<CR>** text is entered **<ctrl-Z/ESC>** ESC quits without sending 2) If PDU mode (+CMGF=0): **AT+CMGC=<length><CR>** PDU is given **<ctrl-Z/ESC>**	Response TA transmits SMS Command message from a TE to the network (SMS-COMMAND). Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code. If text mode (+CMGF=1) and sending successful: **+CMGC: <mr>** **OK** If PDU mode (+CMGF=0) and sending successful: **+CMGC: <mr>** **OK** If error is related to ME functionality: **+CMS ERROR: <err>**
	Parameters **<fo>** First octet of 3GPP 23.040 SMS-COMMAND (default 2) in integer format

	<ct> 3GPP 23.040 TP-Command-Type in integer format (default 0) **<pid>** 3GPP 23.040 TP-Protocol-Identifier in integer format (default 0) **<mn>** 3GPP 23.040 TP-Message-Number in integer format **<da>** 3GPP 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS); type of address given by <**toda**> **<toda>** 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <**da**> is + (IRA 43) default is 145, otherwise default is 129) **<length>** Integer type value indicating in PDU mode (**+CMGF=0**), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) <**mr**> 3GPP 23.040 TP-Message-Reference in integer format
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
Reference 3GPP TS 27.005	Note

4.2.9 AT+CNMI New SMS Message Indications

AT+CNMI New SMS Message Indications	
Test Command **AT+CNMI=?**	Response **+CNMI: (**list of supported <**mode**>s**),(**list of supported <**mt**>s**),(**list of supported <**bm**>s**),(**list of supported <**ds**>s**),(**list of supported <**bfr**>s**)** **OK**
	Parameters See Write Command
Read Command **AT+CNMI?**	Response **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>** **OK**
	Parameters See Write Command
Write Command **AT+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]**	Response TA selects the procedure for how the receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in 3GPP 23.038.

	OK or **ERROR**
	Parameters **<mode>** 0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. 3 Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode. **<mt>** (the rules for storing received SMs depend on its data coding scheme (refer 3GPP 23.038 [2]), preferred memory storage (+CPMS) setting and this value): 0 No SMS-DELIVER indications are routed to the TE. 1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index> 2 SMS-DELIVERs (except class 2) are routed directly to the TE using unsolicited result code: **+CMT: [<alpha>],<length><CR><LF><pdu>** (PDU mode enabled) or **+CMT:** **<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>** (text mode enabled; about parameters in italics, refer Command Show Text Mode Parameters +CSDH). Class 2 messages result in indication as defined in <**mt**>=1. 3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <**mt**>=2. Messages of other classes result in indication as defined in <**mt**>=1. **<bm>** (the rules for storing received CBMs depend on its data coding scheme (refer 3GPP 23.038 [2]), the setting of Select CBM Types (+CSCB) and this value): 0 No CBM indications are routed to the TE **<ds>** 0 No SMS-STATUS-REPORTs are routed to the TE. 1 SMS-STATUS-REPORTs are routed to the TE using unsolicited

	result code: **+CDS: <length><CR><LF><pdu>** (PDU mode enabled) or **+CDS: <fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st>** (text mode enabled) 2 SMS status reports are stored and indication of memory location routed to TE using unsolicited result **+CDSI: "SR",<index>** **<bfr>** 0 TA buffer of unsolicited result codes defined within this Command is flushed to the TE when <**mode**> 1...3 is entered (OK response shall be given before flushing the codes). 1 TA buffer of unsolicited result codes defined within this command is cleared when <**mode**> 1…3 is entered <**mem**> Memory storage (for +**CMTI** and +**CBMI** indications) "**SM**" SMS message storage in SIM "**SR**" status report message storage (in SIM if EF-SMR file present) or in MMI NVRAM if MMI present. <**index**> Integer type indicating storage location (for +CMTI and +CBMI indications)
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note CB messages are not supported for NB-IoT.

4.2.10 AT+CPMS Preferred SMS Message Storage

AT+CPMS Preferred SMS Message Storage	
Test Command **AT+CPMS=?**	Response **+CPMS: (**list of supported <**mem1**>s**),(**list of supported <**mem2**>s**),(**list of supported <**mem3**>s**)** **OK**
	Parameters See Write Command
Read Command **AT+CPMS?**	Response **+CPMS:** **<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>** **OK** or **ERROR**
	Parameters See Write Command

Write Command **AT+CPMS=<mem1>[,<mem2>[,<mem3>]]**	Response TA selects memory storages <mem1>,<mem2> and <mem3> to be used for reading, writing, etc. **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK** or **ERROR**
	Parameters **<mem1>** Messages to be read and deleted from this memory storage "SM" SIM message storage "SR" Status Report message storage (EF-SMR if available on SIM). SR in SIM are only associated with SMSs stored on SIM. If EF-SMR not available and MMI is present then status reports are stored in NVRAM. In addition MMI can store status reports in NVRAM as well as ones stored on SIM (EF-SMR file), if available. **<mem2>** Messages will be written and sent to this memory storage "SM" SIM message storage **<mem3>** Received messages will be placed in this memory storage if routing to PC is not set ("+CNMI") "SM" SIM message storage **<usedx>** Integer type; Number of messages currently in <memx> **<totalx>** Integer type; Number of messages storable in <memx>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note

4.2.11 AT+CRES Restore SMS Settings

AT+CRES Restore SMS Settings	
Test Command **AT+CRES=?**	Response **+CRES: (**list of supported **<profile>**s**)** **OK**
	Parameter See Write Command
Write Command **AT+CRES=<profile>**	Response TA restores SMS settings for +CMGF, +CNMI, and +CSDH from non-volatile memory to active memory. **OK**

	or **ERROR**
	Parameter **<profile>** 0 manufacturer specific profile number to store the settings
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference 3GPP TS 27.005	Note

4.2.12 AT+CSAS Save SMS Settings

AT+CSAS Save SMS Settings	
Test Command **AT+CSAS=?**	Response **+CSAS: (**list of supported **<profile>**s**)** **OK**
	Parameter See Write Command
Write Command **AT+CSAS=<profile>**	Response TA saves current message service settings for +CMGF, +CNMI, and +CSDH, to a non-volatile memory. **OK** or **ERROR**
	Parameter **<profile>** 0 manufacturer specific profile number where settings are to be stored
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference 3GPP TS 27.005	Note

4.2.13 AT+CSCA SMS Service Center Address

AT+CSCA SMS Service Center Address	
Test Command **AT+CSCA=?**	Response **OK**
Read Command	Response

AT+CSCA?	**+CSCA: <sca>,<tosca>** **OK**
	Parameters See Write Command
Write Command **AT+CSCA=<sca>[,<tosca>]**	Response TA updates the SMSC address, through which mobile originated SMS are transmitted. In text mode, setting is used by send and writes commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero. Note: The Command writes the parameters in NON-VOLATILE memory. **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<sca>** 3GPP 24.011 RP SC address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS); type of address given by <tosca> **<tosca>** Service center address format 3GPP 24.011 RP SC address Type-of-Address octet in integer format (default refer <toda>)
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference 3GPP TS 27.005	Note

4.2.14 AT+CSDH Show SMS Text Mode Parameters

AT+CSDH Show SMS Text Mode Parameters	
Test Command **AT+CSDH=?**	Response **+CSDH: (**list of supported **<show>**s**)** **OK**
	Parameter See Write Command
Read Command **AT+CSDH?**	Response **+CSDH: <show>** **OK**

	Parameter See Write Command
Write Command **AT+CSDH=[<show>]**	Response TA determines whether detailed header information is shown in text mode result codes. **OK**
	Parameter **<show>** 0 Do not show header values defined in commands +CSCA and +CSMP (<sca>,<tosca>,<fo>,<vp>,<pid> and <dcs>) nor <length>,<toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode 1 Show the values in result codes
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note

4.2.15 AT+CSMP Set SMS Text Mode Parameters

AT+CSMP Set SMS Text Mode Parameters	
Test Command **AT+CSMP=?**	Response **OK**
	Parameters See Write Command
Read Command **AT+CSMP?**	Response **+CSMP: <fo>,<vp>,<pid>,<dcs>** **OK**
	Parameters See Write Command
Write Command **AT+CSMP=[<fo>[,<vp>,<pid>,<dcs>]]**	Response TA selects values for additional parameters needed when SM is sent to the network or placed in a storage when text mode is selected (+CMGF=1). It is possible to set the validity period starting from when the SM is received by the SMSC (<**vp**> is in range 0... 255) . **OK**
	Parameters <**fo**> first octet of 3GPP 23.040 SMS-DELIVER, SMS-SUBMIT in integer format. The following fields can be modified:

	TP-Message-Type-Indicator (bits 0-1) (SMS-DELIVER or SMS-SUBMIT) TP-Reject-Duplicates (bit 2) TP-Validity-Period-Format (bits 3-4) TP-Status-Report-Request (bit 5) TP-User-Data-Header-Indicator (bit 6) TP-Reply-Path (bit 7). Default value is 17 (SMS-SUBMIT and Validity Period in relative format) When concatenated SMS is supported by MT2625, attempts to change the following fields from the default will produce an **ERROR**: TP-User-Data-Header-Indicator (bit 6) – the UDHI field is used for concatenated SMSs and is set by the Background Layer where appropriate. <**vp**> 3GPP 23.040 TP-Validity-Period in integer format (default 167) <**pid**> 3GPP 23.040 TP-Protocol-Identifier in integer format (default 0) <**dcs**> 3GPP 23.038 SMS Data Coding Scheme in Integer format (default 0 i.e. 7-bit coding).
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note ● The command writes the settings <**vp**>,<**pid**> and <**dcs**> in SIM memory. <**fo**> field is not stored anywhere. ● On startup, the settings <**vp**>,<**pid**> and <**dcs**> are read from the SIM and used for SMS AT commands. If they cannot be found in the SIM they are set to the default values. ● The <**fo**> field is always set to the default value at startup.

4.2.16 AT+CSMS Select Message Service

AT+CSMS Select Message Service	
Test Command **AT+CSMS=?**	Response **+CSMS:** (list of supported <**service**>s) **OK**
	Parameter See Write Command
Read Command **AT+CSMS?**	Response **+CSMS: <service>,<mt>,<mo>,<bm>** **OK**

	Parameters See Write Command
Write Command **AT+CSMS=<service>**	Response **+CSMS: <mt>,<mo>,<bm>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<service>** 0 3GPP 23.040 and 23.041. 1 3GPP 23.040 and 23.041, with a requirement that a message routed directly to TE should be acknowledged via +CNMA. 128 SMS PDU mode - TPDU only used for sending/receiving SMSs. **<mt>** Mobile Terminated Messages: 0 Type not supported 1 Type supported **<mo>** Mobile Originated Messages: 0 Type not supported 1 Type supported **<bm>** Broadcast Type Messages: 0 Type not supported
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note ● **<service>** value 128 is MediaTek proprietary ● **<bm>** message type is not supported

4.2.17 AT+CNMA New Message Acknowledgement to ME/TA

AT+CNMA New Message Acknowledgement to ME/TA	
Test Command **AT+CNMA=?**	Response If PDU mode (**+CMGF=0**): **+CNMA:** (list of supported **<n>**s) **OK** If Text mode (**+CMGF=1**): **OK**
	Parameter See Write Command

Write Command **AT+CNMA[=<n>[,<length[<CR> PDU is entered <CTRL-Z/ESC]]]**	Response After SMS is routed to the TA (based on message class and +CNMI settings as defined in 27.005), TA sends acknowledgement command to the network. Note: this functionality shall be used only when +CSMS parameter <**service**> equals 1. If command is executed but no acknowledgement is expected, or some other error ME related error occurs: **+CMS ERROR: <err>** If PDU mode (+CMGF=0): **OK** If Text mode (+CMGF=1): **ERROR**
	Parameters <**n**> 0 Operates similarly as defined for text mode (if ME doesn't get acknowledgement within required time, ME should respond as specified in 3GPP 24.011, and ME shall automatically disable routing to TE setting both <mt> and <ds>values of CNMI to zero). 1 Send positive acknowledgement to the network with optional PDU message 2 Send negative acknowledgement to the network with optional PDU message <**length**> Length of the optional PDU message. Integer type
Execution Command **AT+CNMA**	Response **OK** If command is executed but no acknowledgement is expected, or some other error ME related error occurs: **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note

4.2.18 AT+CMMS More Messages to Send

AT+CMMS More Messages to Send	
Test Command **AT+CMMS=?**	Response **+CMMS:** (list of supported <**n**>s)

	OK
Read command **AT+CMMS?**	Response **+CMMS: <n>** **OK**
Write Command **AT+CMMS=<n>**	Response TA sets continuity of SMS relay protocol link. When feature is enabled multiple messages can be sent much faster as link is kept open: If error is related to ME functionality: **+CMS ERROR <err>**
	Parameters <**n**> 0 Disable 1 Keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 1-5 seconds(the exact value is up to ME implementation), then ME shall close the link and TA switches <**n**> automatically back to 0 2 Enable (if the time between the response ofthe latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the link but TA shall not switch automatically back to <**n**>=0)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.005	Note

5 AT Commands Special for SIMCom

5.1 Overview of AT Commands Special for SIMCom

Command	Description
AT+CPOWD	Power off
AT+CADC	Read ADC
AT+CLTS	Get local timestamp
AT+CBAND	Get and set mobile operation band
AT+CBANDSL	Set modem NB-IOT search prefer band list
AT+CENG	Switch on or off engineering mode
AT+CCID	Show ICCID
AT+EXUNSOL	Enable or disable proprietary unsolicited indications
AT+GSV	Display product identification information
AT*CELLLOCK	Set the list of ARFCN which needs to be locked
AT+SLEDS	Set the timer period of net light
AT+CNETLIGHT	Close the net light or open it to shining
AT+CSMINS	SIM inserted status reporting
AT+CSPCHSC	Set Scrambling Algorithm for NPDSCH
AT+CPSMSTATUS	Enable Deep Sleep Wakeup Indication
AT+CSCLK	Configure Slow Clock
AT+CRESET	Trigger WDT Reset
AT+CREVHEX	Control the Data Output Format
AT+CDISAUPDN	Control the Auto PDN Status
AT+CNWRCCFG	Network Recovery Configure
AT+CURTC	Control CCLK Show UTC Or RTC Time
AT+CHOMENW	Display Home Network Information
AT+CBATCHK	Set VBAT checking feature ON/OFF
AT+CGPIO	Control the GPIO by PIN index
AT*MEDRXCFG	eDRX configuaration
AT*MSACL	Enable/Disable ACL feature
AT*MLACL	Display ACL List
AT*MWACL	Write an ACL entry
AT*MDACL	Delete an ACL entry
AT+CNBIOTDT	NB-IOT Data Type
AT+CNBIOTRAI	NB-IOT Release Assistance Indication

5.2 Detailed Descriptions of Commands

5.2.1 AT+CPOWD Power Off

AT+CPOWD Power Off	
Write Command **AT+CPOWD=<n>**	Response **[NORMAL POWER DOWN]**
	Parameter **<n>** 0 Power off urgently (Will not send out NORMAL POWER DOWN) 1 Normal power off (Will send out NORMAL POWER DOWN)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

5.2.2 AT+CADC Read ADC

AT+CADC Read ADC	
Test Command **AT+CADC=?**	Response **+CADC:** (list of supported <**status**>s),(list of supported <**value**>s) **OK**
	Parameters **<status>** 1 Success 0 Fail **<value>** Integer 0-1400
Read Command **AT+CADC?**	Response **+CADC: <status>,<value>** **OK**
	Parameters See Test Command
Parameter Saving Mode	NO_SAVE
Max Response Time	2s
Reference	Note

5.2.3 AT+CLTS Get Local Timestamp

AT+CLTS Get Local Timestamp	
Test Command **AT+CLTS=?**	Response **+CLTS: (**list of supported **<mode>**s**)** **OK**
Read Command **AT+CLTS?**	Response **+CLTS: <mode>** **OK**
Write Command **AT+CLTS=<mode>**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<mode>** 0 Disable 1 Enable
	Unsolicited Result Code **+CLTS: <time>**
	Parameters <**time**> String type value; format is yy/MM/dd,hh:mm:ss±zz, where characters indicate year (two last digits),month, day, hour, minutes, seconds and time zone. E.g 10/05/06,00:01:52+32. If there is daylight saving time on the network then display: **+CLTS: 18/06/22,09:27:49+32,"DST +2 in use"** or **+CLTS: 18/06/22,09:27:49+32,"DST +1 in use"**.
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	Note

5.2.4 AT+CBAND Get and Set Mobile Operation Band

AT+CBAND Get and Set Mobile Operation Band	
Test Command **AT+CBAND=?**	Response **+CBAND: (**list of supported **<band>**s**)** **OK**

	Parameter See Write Command
Read Command **AT+CBAND?**	Response **+CBAND: <op_band>** **OK**
	Parameter See Write Command
Write Command **AT+CBAND=<op_band>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameter **<op_band>** Integer value indicating current selected NB-IOT band Valid values: <band> response of test command. **<band>** Integer value indicating supported band.
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	Note

5.2.5 AT+CBANDSL Set Modem NB-IOT Search Prefer Band List

AT+CBANDSL Set Modem NB-IOT Search Prefer Band List	
Test Command **AT+CBANDSL=?**	Response **+CBANDSL: (**list of supported **<enable>**s**),(**list of supported **<band number>**s**),(**list of supported **<band>**s**)** **OK**
	Parameter See Write Command
Write Command **AT+CBANDSL=<enable>[,<band number>,<band1>[,<band2>[,<band3>[,<ban4>]]]]**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameter **<enable>** Integer value indicating search prefer band list enable or disable 0 Disable 1 Enable **<band number>** Integer value indicating search prefer band number. Valid values: 1,2,3,4

	<band*n*> Integer value indicating current search prefer NB-IOT band. Valid values: <**band**> response of test command.
Read Command **AT+CBANDSL?**	Response **[+CBANDSL: <band>**] **OK**
	Parameters See Write Command
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note

5.2.6 AT+CENG Report Network State

AT+CENG Report Network State	
Test Command **AT+CENG=?**	Response TA returns the list of supported modes. **+CENG: (**list of supported <**mode**>s**)** **OK**
	Parameters See Write Command
Read Command **AT+CENG?**	Response <mode>=0 display serving cell and up to 4 neighbor cell information: +**CENG**: **<sc_earfcn>,<sc_earfcn_offset>,<sc_pci>,<sc_cellid>[,<sc_rsrp>][,<sc_rsrq>][,<sc_rssi>][,<sc_snr>],<sc_band>,<sc_tac>[,<sc_ecl>][,<sc_tx_pwr>][,<sc_re_rsrp>][<CR><LF>+CENG:** **<nc_earfcn>,<nc_earfcn_offset>,<nc_pci>,<nc_rsrp>** **[…]]** **OK** <mode>=1 display data transfer information only if modem in RRC-CONNECTED state: +**CENG**: **<RLC_UL_BLER>,<RLC_DL_BLER>,<MAC_UL_BLER>,<MAC_DL_BLER>,<MAC_UL_total_bytes>,<MAC_DL_total_bytes>,<MAC_UL_total_HARQ_TX>,<MAC_DL_total_HARQ_TX>,<MAC_UL_HARQ_re_TX>,<MAC_DL_HARQ_re_TX>,<RLC_UL_tput>,<RLC_DL_tput>,<MAC_UL_tput>,<MAC_DL_tput>**

	OK If error is related to wrong AT syntax or incorrect <mode> or UE in incorrect state **+CME ERROR: <err>**
	Parameters See Write Command
Write Command **AT+CENG=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** Integer value indicating requested engineering information. 0 Radio information for serving and neighbor cells 1 Serving Cell/Neighbor Cell information **<sc_earfcn>** Integer value indicating the EARFCN for serving cell. Range 0- 262143 **<sc_earfcn_offset>** Integer value indicating the EARFCN offset for serving cell: 0 Offset of -2 1 Offset of -1 2 Offset of -0.5 3 Offset of 0 4 Offset of 1 **<sc_pci>** Integer value indicating the serving cell physical cell ID. Range 0-503. **<sc_cellid>** String type; four byte (28 bit) cell ID in hexadecimal format for serving cell. **<sc_rsrp>** Signed integer indicating serving cell RSRP value in units of dBm (can be negative value). Available only in RRC-IDLE state. **<sc_rsrq>** Signed integer indicating serving cell RSRQ value in units of dB (can be negative value). Available only in RRC-IDLE state. **<sc_rssi>** Signed integer indicating serving cell RSSI value in units of dBm (can be negative value). Available only in RRC-IDLE state. **<sc_snr>** Signed integer value. Last SNR value for serving cell in units of dB. Available only in RRC-IDLE state. **<sc_band>** Integer value; current serving cell band **<sc_tac>** String type; two byte tracking area code (TAC) in hexadecimal format (e.g. "00C3" equals 195 in decimal). **<sc_ecl>** Integer value. Last Coverage Enhanced Level (CE Level) value for serving cell. Range 0-2. **<sc_tx_pwr>** Signed integer value indicating current UE transmit power. Units of cBm Centibels relative to one milliwatt (can be negative value).

<**sc_re_rsrp**> Signed integer indicating serving cell RSRP value (the modified) in units of dBm (can be negative value). Available only in RRC-IDLE state.

<nc_earfcn> Integer value indicating the EARFCN for neighbor cell. Range 0-262143

<nc_earfcn_offset> Integer value indicating the EARFCN offset for neighbor cell:

0 Offset of -2
1 Offset of -1
2 Offset of -0.5
3 Offset of 0
4 Offset of 1

<nc_pci> Integer value indicating the neighbor cell physical cell ID. Range 0-503.

<nc_rsrp> Signed integer indicating neighbor cell RSRP value in units of dBm (can be negative value).

Data Transfer Information: s

<RLC_UL_BLER> Integer value. Represented in % value (range 0 to 100). UL block error rate (as per IRQ) in RLC. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established/resumed RRC connection or since previous AT+CENG query with <mode>=1, whichever is later. Only valid in RRC-CONNECTED state.

<RLC_DL_BLER> Integer value Represented in % value (range 0 to 100). DL block error rate (as per ARQ) in RLC. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.

<MAC_UL_BLER> Integer value. Represented in % value (range 0 to 100). UL block error rate (as per HARQ) in MAC for UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.

<MAC_DL_BLER> Integer value. Represented in % value (range 0 to 100). DL block error rate (as per HARQ) in MAC for DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state.

<MAC_UL_total_bytes> Integer value. Total number of transport block bytes (re)transmitted on UL-SCH. Calculated for UL-SCH over all HARQ transmissions and retransmissions. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available

	only in RRC-CONNECTED state. Unit: bytes **<MAC_DL_total_bytes>** Integer value. Total number of transport block bytes (re)transmitted on DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: bytes **<MAC_UL_total_HARQ_TX>** Integer value. Total number of HARQ (re)transmissions for transport blocks on UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: (re)transmissions **<MAC_DL_total_HARQ_TX>** Integer value. Total number of HARQ (re)transmissions for transport blocks on DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: (re)transmissions **<MAC_UL_HARQ_re_TX>** Integer value. Number of HARQ retransmissions for transport blocks on UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: retransmissions **<MAC_DL_HARQ_re_TX>** Integer value. Number of HARQ retransmissions for transport blocks on DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: retransmissions. **<RLC_UL_tput>** Integer value. RLC uplink throughput. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous AT+CENG query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s **<RLC_DL_tput>** Integer value. RLC downlink throughput. Calculated over all established RLC AM radio bearers Calculated from the beginning of successfully established / resumed RRC connection, or since previous AT+CENG query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s **<MAC_UL_tput>** Integer value. UL throughput in MAC for UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state.

	Unit: kbits / s **<MAC_DL_tput>** Integer value. DL throughput in MAC for DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <**mode**>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note If modem is not in RRC-CONNECTED state then +CENG will not be generated for <**mode**>=1. Only OK response will be generated.

5.2.7 AT+CCID Show ICCID

AT+CCID Show ICCID	
Test Command **AT+CCID=?**	Response **OK**
Execution Command **AT+CCID**	Response **Ccid data** [ex. 898600810906F8048812] **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

5.2.8 AT+EXUNSOL Enable or Disable Proprietary Unsolicited Indications

AT+EXUNSOL Enable or Disable Proprietary Unsolicited Indications	
Test Command **AT+EXUNSOL=?**	Response **+EXUNSOL: (**list of supported <**exunsol**>s**)** **OK**
	Parameters See Write Command
Write Command **AT+EXUNSOL=<exunsol>,<mode**	Response **OK** If <**mode**>=2

>	**+EXUNSOL: <mode>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<exunsol>** String type(string should be included in quotation marks). values are currently reserved by the present document "SQ" Signal Quality Report Displays signal strength and channel bit error rate (similar to AT+CSQ) in form **+CSQN: <rssi>,<ber>**when values change. **<mode>** 0 Disable 1 Enable 2 Query
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	Note

5.2.9 AT+GSV Display Product Identification Information

AT+GSV Display Product Identification Information	
Execution Command **AT+GSV**	Response TA returns product information text Example: **SIMCOM_Ltd** **SIM7020C** **Revision: 1752B01SIM7020C** **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

5.2.10 AT*CELLLOCK Set the List of ARFCN Which Needs to Be Locked

AT*CELLLOCK Set the List of ARFCN Which Needs to Be Locked	
Test Command **AT*CELLLOCK=?**	Response **OK** Parameter See Write Command
Read Command **AT*CELLLOCK?**	Response ***CELLLOCK: <lock>[,<earfcn>,<earfcn_offset>[,<pci>]]** **OK** Parameter See Write Command
Write Command **AT*CELLLOCK=<lock>[,<earfcn>,<earfcn_offset>[,<pci>]]**	Response **OK** If error is related to wrong AT syntax or incorrect parameters. **ERROR** Parameter **<lock>** Integer value indicating whether to activate lock, or remove lock: 0 Remove lock 1 Activate lock **<earfcn>** Integer value indicating requested EARFCN on which to lock. Range 0- 262143. Value of 0 indicates to remove any lock for EARFCN and Cell. **<earfcn_offset>** Integer value indicating requested EARFCN offset: 0 Offset of -2 1 Offset of -1 2 Offset of -0.5 3 Offset of 0 4 Offset of 1 **<pci>** Integer value: Physical cell ID. Range: 0-503
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

5.2.11 AT+SLEDS Set the Timer Period of Net Light

AT+SLEDS Set the Timer Period of Net Light

Test Command **AT+SLEDS=?**	Response **+SLEDS: (1-3),(0,40-65535),(0,40-65535)** **OK**
	Parameters See Write Command
Read Command **AT+SLEDS?**	Response **+SLEDS: <mode>,<timer_on>,<timer_off>** **OK**
	Parameters See Write Command
Write Command **AT+SLEDS=<mode>,<timer_on>,<timer_off>**	Response **OK** **ERROR**
	Parameters **<mode>** 1 Set the timer period of net light while SIM7020 series does not register to the network 2 Set the timer period net light while SIM7020 series has already registered to the network 3 Set the timer period net light while SIM7020 series is in the state of PPP communication <**timer_on**> Timer period of "LED ON" in decimal format which range is 0 or 40-65535(ms) <**timer_off**> Timer period of "LED OFF" in decimal format which range is 0 or 40-65535(ms)
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note The default value is: **<mode>,<timer_on>,<timer_off>** 1,64,800 2,64,3000 3,64,300

5.2.12 AT+CNETLIGHT Close the Net Light or Open It to Shining

AT+CNETLIGHT Close the Net Light or Open It to Shining

Test Command **AT+CNETLIGHT=?**	Response **+CNETLIGHT: (0,1)** **OK**
	Parameters See Write Command
Read Command **AT+CNETLIGHT?**	Response **+CNETLIGHT: <mode>** **OK**
	Parameters See Write Command
Write Command **AT+CNETLIGHT=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** 0 Close the net light 1 Open the net light to shining
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note

5.2.13 AT+CSMINS SIM Inserted Status Reporting

AT+CSMINS SIM Inserted Status Reporting	
Test Command **AT+CSMINS=?**	Response **+CSMINS: (**list of supported **<n>**s**)** **OK**
	Parameter See Write Command
Read Command **AT+CSMINS?**	Response **+CSMINS: <n>,<SIM inserted>** **OK**
	Parameters See Write Command

Write Command **AT+CSMINS=<n>**	Response **OK** or **ERROR** If error is related to ME functionality: **+CME ERROR: <err>**
	Unsolicited Result Code **+CSMINS: <n>,<SIM inserted>**
	Parameters **<n>** A numeric parameter to show an unsolicited event code indicating whether the SIM has been inserted or removed. 0 Disable 1 Enable **<SIM inserted>** A numeric parameter which indicates whether SIM card has been inserted. 0 Not inserted 1 Inserted
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	Note

5.2.14 AT+CSPCHSC Set Scrambling Algorithm for NPDSCH

AT+CSPCHSC Set Scrambling Algorithm for NPDSCH	
Test Command **AT+CSPCHSC=?**	Response **+CSPCHSC: (0-1)** **OK**
	Parameter See Write Command
Read Command **AT+CSPCHSC?**	Response **+CSPCHSC: <mode>** **OK**
	Parameter See Write Command
Write Command **AT+CSPCHSC=<mode>**	Response **OK** If error is related to wrong AT syntax or incorrect parameters. **ERROR**

	Parameter **<mode>** 0 Close scrambling algorithm 1 Open scrambling algorithm
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note

5.2.15 AT+CPSMSTATUS Enable Deep Sleep Wakeup Indication

AT+CPSMSTATUS Enable Deep Sleep Wakeup Indication	
Test Command **AT+CPSMSTATUS=?**	Response **+CPSMSTATUS: (0-1)** **OK**
	Parameter See Write Command
Read Command **AT+CPSMSTATUS?**	Response **+CPSMSTATUS: <enable>** **OK**
	Parameter See Write Command
Write Command **AT+CPSMSTATUS=<enable>**	Response **OK** If error is related to wrong AT syntax or incorrect parameters. **ERROR**
	Parameter **<enable>** 0 Disable indication on this channel when modem wakes up from deep sleep 1 Enable indication on this channel when modem wakes up from Deep sleep
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	Note

5.2.16 AT+CSCLK Configure Slow Clock

AT+CSCLK Configure Slow Clock	
Test Command **AT+CSCLK=?**	Response **+CSCLK: (**list of supported **<n>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CSCLK?**	Response **+CSCLK: <n>** **OK**
	Parameters See Write Command
Write Command **AT+CSCLK=<n>**	Response **OK** or **ERROR**
	Parameters **<n>** 0 Disable slow clock, module will not enter sleep mode. 1 Enable slow clock, it is controlled by DTR. When DTR is high, module can enter sleep mode. When DTR changes to low level, module can quit sleep mode. 2 Enable slow clock automatically. When there is no interrupt (on air and hardware such as GPIO interrupt or data in serial port), module can enter sleep mode. Otherwise, it will quit sleep mode.
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note ● Only UART1 can enable csclk as 1 or 2. ● There are two caveats when you want to quit sleep mode in mode 2: 1, You should input some characters (at least one) to awake module 2, An interval time of 100ms more is necessary between waking characters and following AT commands,otherwise the waking characters will not be discarded completely,and messy codes will be produced which may leads to UART baudrate re-adaptation. ● Scope of parameter <**n**> is different among SIM7020 series project, please refer to chapter 21 for details.

5.2.17 AT+CRESET Trigger WDT Reset

AT+CRESET Trigger WDT Reset	
Test Command **AT+CRESET=?**	Response **OK**
Execution Command **AT+CRESET**	Response If it succeeds, the system will reboot immediately.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

5.2.18 AT+CREVHEX Control the Data Output Format

AT+CREVHEX Control the Data Output Format	
Test Command **AT+CREVHEX=?**	Response **+CREVHEX: (**list of supported **<n>**s**)** **OK**
Read Command **AT+CREVHEX?**	Response **+CREVHEX:** <**n**> **OK**
Write Command **AT+CREVHEX=<n>**	Response **OK** If error is related to wrong AT syntax or incorrect parameters. **ERROR**
	Parameters **<n>** 0 The data output format is raw data. 1 The data output format is hexadecimal.
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note

5.2.19 AT+CDISAUPDN Control the Auto PDN Status

AT+CDISAUPDN Control the Auto PDN Status	
Test Command **AT+CDISAUPDN=?**	Response **+CDISAUPDN: (**list of supported **<n>**s**)** **OK**
Read Command **AT+CDISAUPDN?**	Response **+CDISAUPDN:** <**n**> **OK**
Write Command **AT+CDISAUPDN=<n>**	Response **OK** If error is related to wrong AT syntax or incorrect parameters. **ERROR**
	Parameters **<n>** 0 Diable auto PDN, should reboot the module to check. 1 Enable auto PDN, should reboot the module to check.
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note

5.2.20 AT+CNWRCCFG Network Recovery Configure

AT+CNWRCCFG Network Recovery Configure	
Test Command **AT+CNWRCCFG=?**	Response **+CNWRCCFG:** **(5-28800),(5-28800),(5-28800),(5-28800),(5-28800),(5-28800)** **OK**
	Parameter See Write Command
Read Command **AT+CNWRCCFG?**	Response **+CNWRCCFG:** **<recovery_internal1>,<recovery_internal2>,<recovery_internal3>,<recovery_internal4>,<recovery_internal5>,<recovery_internal6>** **OK**
	Parameter

	See Write Command
Write Command **AT+CNWRCCFG=<recovery_internal1>,<recovery_internal2>,<recovery_internal3>,<recovery_internal4>,<recovery_internal5>,<recovery_internal6>**	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameter <**recovery_internal1**> 1 step network searching interval after out of service Range: 5-28800(s) Default: 5(s) <**recovery_internal2**> 2 step network searching interval after out of service Range: 5-28800(s) Default: 10(s) <**recovery_internal3**> 3 step network searching interval after out of service Range: 5-28800(s) Default: 10(s) <**recovery_internal4**> 4 step network searching interval after out of service Range: 5-28800(s) Default: 1(s) <**recovery_internal5**> 5 step network searching interval after out of service Range: 5-28800(s) Default: 120(s) <**recovery_internal6**> 6 step network searching interval after out of service Range: 5-28800(s) Default: 7200(s)
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note The config will effect after rebooting.

5.2.21 AT+CURTC Control CCLK Show UTC Or RTC Time

AT+CURTC Control CCLK Show UTC Or RTC Time	
Test Command **AT+CURTC=?**	Response **+CURTC: (0,1)** **OK**
	Parameters See Write Command
Read Command **AT+CURTC?**	Response **+CURTC: <opt>** **OK**
	Parameter See Write Command
Write Command **AT+CURTC=<opt>**	Response **+CURTC: <opt>**

	OK
	Parameters **<opt>** A numeric parameter. 0 CCLK show UTC time after network time synchronization 1 CCLK show RTC time after network time synchronization
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	Note

5.2.22 AT+CHOMENW Display Home Network Information

AT+CHOMENW Display Home Network Information	
Test Command **AT+CHOMENW=?**	Response **OK**
	Parameters See Read Command
Read Command **AT+CHOMENW?**	Response UE returns the home network information (extracted form the IMSI)in long alpha,short alpha and numeric formats. **+CHOMENW: <oper_long>,<oper_short>,<oper_numeric>** **OK**
	Parameters **<oper_long>** Home operator in long alphanumeric format **<oper_short>** Home operator in short alphanumeric format **<oper_numeric>** Home operator in numeric GSM Loation Area Identification number format
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

5.2.23 AT+CBATCHK Set VBAT Checking Feature ON/OFF

AT+CBATCHK Set VBAT Checking Feature ON/OFF	
Test Command **AT+CBATCHK=?**	Response **+CBATCHK: (0,1)**

	OK
Read Command **AT+CBATCHK?**	Response **+CBATCHK: <mode>** **OK**
	Parameters See Write Command
Write Command **AT+CBATCHK=<mode>**	Response **OK** If failed: **+CME ERROR: <err>**
	Parameters **<mode>** 0 Close the function of VBAT checking 1 Open the function of VBAT checking
Parameter Saving Mode	
Max Response Time	-
Reference	

5.2.24 AT+CGPIO Control the GPIO by PIN Index

AT+CGPIO Control the GPIO by PIN Index	
Test Command **AT+CGPIO=?**	Response **+CGPIO: (0-1),(**list of supported <**pin**>s**),(0-1),(0-1)** **OK**
	Parameters See Write Command
Write Command **AT+CGPIO=<operation>,<pin>,<function>,<level>**	Response **OK** or **ERROR**
	Parameters **<operation>** 0 Set the GPIO function including the GPIO output . 1 Read the GPIO level. Please note that only when the gpio is set as input, user can use parameter 1 to read the GPIO level, otherwise the module will return "**ERROR**". **<pin>** The PIN index you want to be set. (It has relations with the

	hardware, please refer to the hardware manual) **<function>** Only when <**operation**> is set to 0, this option takes effect. 0 Set the GPIO to input 1 Set the GPIO to output **<level>** 0 Set the GPIO low level 1 Set the GPIO high level
Reference	Note

5.2.25 AT*MEDRXCFG eDRX Configuaration

AT*MEDRXCFG eDRX Configuaration	
Test Command **AT*MEDRXCFG=?**	Response ***MEDRXCFG: (**list of supported <**mode**>s**),(**list of supported <**AcT-type**>s**),(**list of supported <**Requested_eDRX_value**>s**),(**list of supported <**Requested_Paging_time_window_value**>s**)** **OK**
	Parameters See Write Command
Read Command **AT*MEDRXCFG?**	Response **[*MEDRXCFG:** **<AcT-type>,<Requested_eDRX_value>**[,<**Requested_Paging_time_window_value**>]**[<CR><LF>*MEDRXCFG:** **<AcT-type>,<Requested_eDRX_value>**[,<**Requested_Paging_time_window_value**>] […]]] **OK**
	Parameters See Write Command
Write Command **AT*MEDRXCFG=[<mode>[,<AcT-type>[,<Requested_eDRX_value>[,<Requested_Paging_time_window_value>]]]]**	Response **OK** or **+CME ERROR: <err>**
	Parameters <**mode**> Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>. 0 Disable the use of eDRX 1 Enable the use of eDRX

	2 Enable the use of eDRX and enable the unsolicited result code **+CEDRXP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]]** 3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values. <**AcT-type**> Integer type, indicates the type of access technology. This AT- command is used to specify the relationship between the type of access technology and the requested eDRX value. 0 Access technology is not using eDRX. This parameter value is only use in the unsolicited result code. 5 E-UTRAN (NB-S1 mode) <**Requested_eDRX_value**> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific. <**Requested_Paging_time_window_value**> String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. <**NW-provided_eDRX_value**> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub- clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. <**Paging_time_window**> String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
Reference	Note

5.2.26 AT*MSACL Enable/Disable ACL feature

AT*MSACL Enable/Disable ACL feature	
Test Command **AT*MSACL=?**	Response ***MSACL: (0-1)** **OK**
	Parameters See Write Command
Read Command **AT*MSACL?**	Response ***MSACL: <supported><enabled>** **OK**
	Parameters See Write Command
Write Command **AT*MSACL=<mode>[,<PIN2>]**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<mode>** Action selected 0 ACL to be disabled 1 ACL to be enabled **<supported>** 0 ACL not supported by SIM 1 ACL supported by SIM **<enabled>** 0 ACL disabled by user 1 ACL enabled by user <**PIN2**>
Parameter Saving Mode	-
Max Response Time	-
Reference	Note Enables/disables ACL feature for the mobile unit. If enabled and supported by the SIM, PDP Activations are only possible with APNs which are present in the ACL list. If PIN2 is not confirmed before the command is issued, the PIN2 should be supplied as a second parameter.

5.2.27 AT*MLACL Display ACL List

AT*MLACL Display ACL List	
Test Command **AT*MLACL=?**	Response ***MLACL: (0-255),(0-255)** **OK**
	Parameters See Write Command
Write Command **AT*MLACL=<from>[,<to>]**	Response ***MLACL: <index>,<APN>** **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<from>** Start index **<to>** End index **<index>** Entry index **<APN>** APN in textual format
Parameter Saving Mode	-
Max Response Time	-
Reference	Note Only applies to USIM (3G).

5.2.28 AT*MWACL Write an ACL entry

AT*MWACL Write an ACL entry	
Test Command **AT*MWACL=?**	Response ***MWACL: (0-255)** **OK**
	Parameters See Write Command
Write Command **AT*MWACL=<index>,<APN>[,<PIN2>]**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<index>** Entry index **<APN>** APN in textual format

	<**PIN2**> Personal Identification Number 2
Parameter Saving Mode	-
Max Response Time	-
Reference	Note Only applies to USIM (3G).

5.2.29 AT*MDACL Delete an ACL entry

AT*MDACL	**Delete an ACL entry**
Test Command **AT*MDACL=?**	Response ***MDACL: (0-255)** **OK**
	Parameters See Write Command
Write Command **AT*MDACL=<index>[,<PIN2>]**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<index>** Entry index <**PIN2**>
Parameter Saving Mode	-
Max Response Time	-
Reference	Note Deletes an ACL entry from the specific index in the list. The entry will be deleted, and all the following entries moved to the previous index to cover the deleted entry, leaving the continuous list. If PIN2 is not confirmed before the command is issued, PIN2 should be supplied as a second parameter.

5.2.30 AT+CNBIOTDT NB-IOT Data Type

AT+CNBIOTDT	**NB-IOT Data Type**
Test Command **AT+CNBIOTDT=?**	Response **+CNBIOTDT: (**list of supported <**type**>s**)** **OK**
	Parameters

	See Write Command
Read Command **AT+CNBIOTDT?**	Response Displays <type> for all active PDP contexts: **[+CNBIOTDT: <cid>,<type>][<CR><LF>+CNBIOTDT: <cid>,<type>][…]]** **OK**
	Parameters See Write Command
Write Command **AT+CNBIOTDT=<type>[,<cid>[,<cid>[,…]]]**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<type>** Integer type 0 Normal data 1 Exceptional data **<cid>** Integer type. Specifies a particular PDP context definition. If no <**cid**>s are specified the command sets <**type**> for all active PDP contexts.
Parameter Saving Mode	-
Max Response Time	-
Reference	Note The UE will not remember this setting over sleep cycles (i.e. the UE will fall back to default setting after sleep)

5.2.31 AT+CNBIOTRAI NB-IOT Release Assistance Indication

AT+CNBIOTRAI NB-IOT Release Assistance Indication	
Test Command **AT+CNBIOTRAI=?**	Response **+CNBIOTRAI: (**list of supported <**rai**>s**)** **OK**
	Parameters See Write Command
Read Command **AT+CNBIOTRAI?**	Response **+CNBIOTRAI: <rai>** **OK**
	Parameters

	See Write Command
Write Command **AT+CNBIOTRAI=<rai>**	Response **OK** If error is related to wrong AT syntax: **+CME ERROR: <err>**
	Parameters **<rai>** Integer type. Specifies release assistance information. 0 No information available (or none of the other options apply) 1 TE will send only 1 UL packet and no DL packets expected 2 TE will send only 1 UL packet and only 1 DL packet expected
Parameter Saving Mode	-
Max Response Time	-
Reference	Note ● This command may never be required as it is likely that the TE will not know this information. ● Modem applies specified <rai> value only to next UL packet sent by TE. ● TE will not remember this setting over sleep cycles (i.e. will fall back to default after sleep).

6 AT Commands for TCPIP Application Toolkit

6.1 Overview of AT Commands for TCPIP Application Toolkit

Command	Description
AT+CSOC	Create a TCP/UDP socket
AT+CSOCON	Connect socket to remote address and port
AT+CSOB	Bind local address and local port
AT+RETENTION	Retention of socket scence
AT+CSOSEND	Send data to remote via socket
AT+CSODSEND	Send data to remote via socket with data mode
AT+CSOCL	Close socket
AT+CSOSENDFLAG	Set TCP send flag
AT+CSORCVFLAG	Set receive flag
AT+CSOSTATUS	Get socket status
AT+CSOACK	Query previous connection data transmitting state
AT+CSOALIVE	Set TCP keepalive parameters
+CSONMI	Socket message arrived indicator
+CSOERR	Socket error indicator

6.2 Detailed Descriptions of AT Commands for TCPIP Application Toolkit

6.2.1 AT+CSOC Create a TCP/UDP Socket

AT+CSOC Create a TCP/UDP Socket	
Test Command **AT+CSOC=?**	Response **+CSOC: (1-2),(1-3),(1-3)** **OK**
	Parameters See Write Command
Read Command **AT+CSOC?**	Response **OK** or **+CSOC: <socket_id>,<domain>,<type>,<protocol>[<CR><LF>+CSOC: <socket_id>[...]]** **OK**

	Parameters See Write Command
Write Command **AT+CSOC=<domain>,<type>,<protocol>[,<cid>]**	Response **+CSOC: <socket_id>** **OK**
	Parameters **<socket_id>** Integer socket_id. Range is 0-4. **<domain>** Integer 1 IPv4 2 IPv6 **<type>** Integer 1 TCP 2 UDP 3 RAW **<protocol>** Integer 1 IP 2 ICMP 3 UDP_LITE **<cid>** Integer, PDP context ID, AT+CGACT response. [option]
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

6.2.2 AT+CSOCON Connect Socket To Remote Address and Port

AT+CSOCON Connect Socket to Remote Address and Port	
Test Command **AT+CSOCON=?**	Response **OK**
	Parameters See Write Command
Read Command **AT+CSOCON?**	Response If connection exist. **+CSOCON: <socket_id>,<type>[<CR><LF>+CSOCON: <socket_id>,<type>[...]]** **OK**
	Parameters See Write Command
Write Command **AT+CSOCON=<**	Response **OK**

socket_id>,<remote_port>,<remote_address>	If format is wrong or connection exists: **ERROR** If connection is failed: **ERROR** **+CSOERR: <socket_id>,<error_code>**
	Parameters **<socket_id>** Integer, socket_id, response of AT+CSOC. **<remote_port>** Integer, remote port.(1-65535) **<remote_address>** String, remote address. **<type>** Integer 1 TCP 2 UDP 3 RAW <**error_code**> Reference section 5.2.14.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

6.2.3 AT+CSOB Bind Local Address and Local Port

AT+CSOB Bind Local Address and Local Port	
Test Command **AT+CSOB=?**	Response **OK**
	Parameters See Write Command
Read Command **AT+CSOB?**	Response **OK**
	Parameters See Write Command
Write Command **AT+CSOB=<socket_id>,<port>[,<address>]**	Response **OK**
	Parameters **<socket_id>** Integer type, socket_id, AT+CSOC's response. **<port>** Integer type, port,(1-65535). **<address>** String type, address.
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	Note

6.2.4 AT+RETENTION Retention of Socket Scene

AT+RETENTION Retention of Socket Scence	
Test Command **AT+RETENTION=?**	Response **+RETENTION: (0-1)** **OK**
	Parameters See Write Command
Read Command **AT+RETENTION?**	Response **+RETENTION: <retention_socket>** **OK**
	Parameters See Write Command
Write Command **AT+RETENTION=<retention_socket>**	Response **OK**
	Parameters **<retention_socket>** Integer type 0 Not recovery scene when module exited PSM mode 1 Recovery scene when module exited PSM mode
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note AT+CPSMS should be set before this command.

6.2.5 AT+CSOSEND Send Data to Remote via Socket

AT+CSOSEND Send Data to Remote via Socket	
Test Command **AT+CSOSEND=?**	Response **OK**
	Parameters See Write Command
Write Command **AT+CSOSEND=<socket_id>,<data_len>,<data>**	Response If CSOSENDFLAG is 0. **OK** If CSOSENDFLAG is 1 and socket type is TCP. **OK**

	SEND: <socket_id>,<len>
	Parameters **<socket_id>** Integer type, socket_id, AT+CSOC's response. **<data_len>** Integer type, length of data **<data>** Raw_data, data context. Maximum data size is 512 bytes. If <**data_len**> is 0 you can send str to remote socket with double quotation, otherwise the format of data should be hex and the length must be equal to the <**data_len**>. **<len>** Integer type, length of data
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

6.2.6 AT+CSODSEND Send Data to Remote via Socket with Data Mode

AT+CSODSEND Send Data to Remote via Socket with Data Mode	
Test Command **AT+CSODSEND=?**	Response **OK**
	Parameters See Write Command
Write Command **AT+CSODSEND=<socket_id>,<data_len>** response">", then tap data for send	Response If CSOSENDFLAG is 0. **DATA ACCEPT: <len>** If CSOSENDFLAG is 1 and socket type is TCP. **DATA ACCEPT: <len>** **SEND: <socket_id>,<len>**
	Parameters **<socket_id>** Intege rtype, socket_id, AT+CSOC's response. **<data_len>** Integer type, length of data you want to send, 1-768. **<len>** Integer type, length of data that remote have received.
Execution Command **AT+CSODSEND=<socket_id>** response">", then tap data for send, tap CTRL+Z to send, tap ESC to cancel the operation	Response If CSOSENDFLAG is 0. **DATA ACCEPT: <len>** If CSOSENDFLAG is 1 and socket type is TCP. **DATA ACCEPT: <len>** **SEND: <socket_id>,<len>**
	Parameters See Write Command

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

6.2.7 AT+CSOCL Close Socket

AT+CSOCL Close Socket	
Test Command **AT+CSOCL=?**	Response **OK** Parameters See Write Command
Write Command **AT+CSOCL=<socket_id>**	Response **OK** Parameters **<socket_id>** Integer socket_id, AT+CSOC's response.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

6.2.8 AT+CSOSENDFLAG Set TCP Send Flag

AT+CSOSENDFLAG Set TCP Send Flag	
Test Command **AT+CSOSENDFLAG=?**	Response **+CSOSENDFLAG: (0,1)** **OK** Parameters See Write Command
Read Command **AT+CSOSENDFLAG?**	Response **+CSOSENDFLAG: <flag>** **OK** Parameters See Write Command
Write Command **AT+CSOSENDFLAG=<flag>**	Response **OK** Parameters **<flag>** TCP send flag

	0 Disable send flag feature 1 Enable this feature
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note If <**flag**> is 1, the URC will be shown in related command AT+CSOSEND and AT+CSODSEND.

6.2.9 AT+CSORCVFLAG Set Receive Flag

AT+CSORCVFLAG Set Receive Flag	
Test Command **AT+CSORCVFLAG=?**	Response **+CSORCVFLAG: (0,1)** **OK**
	Parameters See Write Command
Read Command **AT+CSORCVFLAG?**	Response **+CSORCVFLAG: <flag>** **OK**
	Parameters See Write Command
Write Command **AT+CSORCVFLAG=<flag>**	Response **OK**
	Parameters **<flag>** TCP receive flag 0 Receive data form remote socket with hex. 1 Receive data form remote socket with string
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note

6.2.10 AT+CSOSTATUS Get Socket Status

AT+CSOSTATUS Get Socket Status	
Test Command	Response

AT+CSOSTATUS=?	**+CSOSTATUS: (0-4)** **OK**
	Parameters See Write Command
Write Command **AT+CSOSTATUS=<socket_id>**	Response **+CSOSTATUS: <socket_id>,<status>** **OK**
	Parameters **<socket_id>** Integer type, socket id, AT+CSOC's response. **<status>** Integer type. 0 None socket 1 Socket create but not connect 2 Connected
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

6.2.11 AT+CSOACK Query Previous Connection Data Transmitting State

AT+CSOACK Query Previous Connection Data Transmitting State	
Test Command **AT+CSOACK=?**	Response **+CSOACK: (0-4)** **OK**
	Parameters See Write Command
Write Command **AT+CSOACK=<socket_id>**	Response **+CSOACK: <socket_id>,<txlen>,<acklen>,<nacklen>** **OK**
	Parameters **<socket_id>** Integer, socket id, AT+CSOC's response. **<txlen>** The data amount which has been sent **<acklen>** The data amount confirmed successfully by the server **<nacklen>** The data amount without confirmation by the server
Execution Command	Response **+CSOACK: <socket_id>,<txlen>,<acklen>,<nacklen>[<CR><LF>**

AT+CSOACK	**+CSOACK: <socket_id>,<txlen>,<acklen>,<nacklen>[...]]** **OK**
	Parameters See Write Command
Parameter Saving Mode	-
Max Response Time	-
Reference	Note

6.2.12 AT+CSOALIVE Set TCP Keepalive Parameters

AT+CSOALIVE	**Set TCP Keepalive Parameters**
Test Command **AT+CSOALIVE=?**	Response **+CSOALIVE: (0-4),(0-1),(30-7200),(30-600),(1-9)** **OK**
	Parameters See Write Command
Read Command **AT+CSOALIVE?**	Response **+CSOALIVE: <socket_id>,<mode>[,<keepIdle>,<keepInterval>,<keepCount>][<CR><LF> +CSOALIVE: <socket_id>,<mode>[,<keepIdle>,<keepInterval>,<keepCount>][…]]** **OK**
	Parameters See Write Command
Write Command **AT+CSOALIVE=<socket_id>,<mode>[,<keepIdle>[,<keepInterval>[,<keepCount>]]]**	Response **OK** If error is related to ME functionality: **ERROR**
	Parameters **<socket_id>** Integer type, socket_id, AT+CSOC's response. **<mode>** Set TCP keepalive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism If <**mode**>=0, executing "AT+CSOALIVE=<socket_id>,<mode>". **<keepIdle>** Integer type; Idle time (in second) before TCP send the initial keepalive probe.

	30-7200 Default: 7200 **<keepInterval>** Interval time (in second) between keepalive probes retransmission. 30-600 Default: 75 **<keepCount>** Integer type; Maximum number of keepalive probes to be sent. 1-9 Default: 9
Reference	Note

6.2.13 +CSONMI Socket message arrived indicator

+CSONMI Socket message arrived indicator	
	Response Indicated there is received some data from network. **+CSONMI: <socket_id>,<data_len>,<data>**
	Parameters **<socket_id>** Integer socket_id,AT+CSOC's response **<data_len>** Integer, length of data **<data>** Raw_data, data context.

6.2.14 +CSOERR Socket Error Indicator

+CSOERR Socket Error Indicator	
	Response Indicated there is some error. **+CSOERR: <socket_id>,<error_code>**
	Parameters **<socket_id>** Integer, socket id, AT+CSOC's response. <**error_code**> -1 Common error 1 Route error 1 Connection abort error 2 Reset error 3 Connected error 4 Value error 5 Buffer error 6 Block error 7 Addr in use error 8 ALR connecting error 9 ALR connected error 10 NETIF error 11 PARAMETER error

7 AT Commands for TCPIP Application Toolkit to Compatible with SIM800 Serials

7.1 Overview of AT Commands

Command	Description
AT+CIPMUX	Start up multi-IP connection
AT+CIPSTART	Start up TCP or UDP connection
AT+CIPSEND	Send data through TCP or UDP connection
AT+CIPQSEND	Select data transmitting mode
AT+CIPACK	Query previous connection data transmitting state
AT+CIPCLOSE	Close TCP or UDP connection
AT+CIPSHUT	Deactivate GPRS PDP context
AT+CLPORT	Set local port
AT+CSTT	Start task and set APN, user name, password
AT+CIICR	Bring up wireless connection
AT+CIFSR	Get local IP address
AT+CIPSTATUS	Query current connection status
AT+CDNSCFG	Configure domain name server
AT+CDNSGIP	Query the IP address of given domain name
AT+CIPHEAD	Add an IP head at the beginning of a package received
AT+CIPHEXS	Show data in hex mode of a package received
AT+CIFSREX	Get local IP address
AT+CIPATS	Set auto sending timer
AT+CIPSPRT	Set prompt of ‘>’ when module sends data
AT+CIPSERVER	Configure module as server
AT+CIPCSGP	Set CSD or GPRS for connection mode
AT+CIPSRIP	Show remote IP address and port when received data
AT+CIPSHOWTP	Display transfer protocol in IP head when received data
AT+CIPUDPMODE	UDP extended mode
AT+CIPRXGET	Get data from network manually
AT+CIPTKA	Set TCP keep alive parameters
AT+CIPMODE	Open transparent mode
AT+CIPCHAN	Enter transparent mode

7.2 Detailed Descriptions of Commands

7.2.1 AT+CIPMUX Start Up Multi-IP Connection

AT+CIPMUX Start Up Multi-IP Connection	
Test Command **AT+CIPMUX=?**	Response **+CIPMUX: (0,1)** **OK**
	Parameters See Write Command
Read Command **AT+CIPMUX?**	Response **+CIPMUX: <n>** **OK**
	Parameters See Write Command
Write Command **AT+CIPMUX=<n>**	Response **OK**
	Parameters **<n>** 0 Single IP connection 1 Multi IP connection
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● Only in IP initial state, AT+CIPMUX=1 is effective; ● Only when multi IP connection and GPRS application are both shut down, AT+CIPMUX=0 is effective.

7.2.2 AT+CIPSTART Start Up TCP or UDP Connection

AT+CIPSTART Start Up TCP or UDP Connection	
Test Command **AT+CIPSTART=?**	Response 1) If AT+CIPMUX=0 **+CIPSTART: (**list of supported **<mode>),(<IP address>),(<port>)** **+CIPSTART: (**list of supported **<mode>),(<domain name>),(<port>)** **OK** 2) If AT+CIPMUX=1

	+CIPSTART: (list of supported **<n>),(**list of supported **<mode>),(<IP address>),(<port>)** **+CIPSTART: (**list of supported **<n>),(**list of supported **<mode>),(<domain name>),(<port>)** **OK**
	Parameters See Write Command
Write Command 1)If single IP connection (+CIPMUX=0) **AT+CIPSTART=<mode>,<IP address>,<port>** or **AT+CIPSTART=<mode>,<domain name>,<port>** 2)If multi-IP connection (+CIPMUX=1) **AT+CIPSTART=<n>,<mode>,<address>,<port>** or **AT+CIPSTART=<n>,<mode>,<domain name>,<port>**	Response 1)If single IP connection (+CIPMUX=0) If format is right response **OK** otherwise response If error is related to ME functionality: **+CME ERROR <err>** Response when connection exists **ALREADY CONNECT** Response when connection is successful **CONNECT OK** Otherwise **STATE: <state>** **CONNECT FAIL** 2)If multi-IP connection(+CIPMUX=1) If format is right **OK** otherwise response If error is related to ME functionality: **+CME ERROR <err>** Response when connection exists **<n>,ALREADY CONNECT** If connection is successful **<n>,CONNECT OK** Otherwise **<n>,CONNECT FAIL**
	Parameters **<n>** Connection number 0..5 A numeric parameter which indicates the connection number **<mode>** A string parameter which indicates the connection type "TCP" Establish a TCP connection "UDP" Establish a UDP connection **<IP address>** A string parameter which indicates remote server IP address **<port>** Remote server port,(1-65535).

	<domain name> A string parameter which indicates remote server domain name **<state>** A string parameter which indicates the progress of connecting In single IP state: 0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 TCP CONNECTING/UDP CONNECTING/ SERVER LISTENING 6 CONNECT OK 7 TCP CLOSING/UDP CLOSING 8 TCP CLOSED/UDP CLOSED 9 PDP DEACT In Multi-IP state: 0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 IP PROCESSING 9 PDP DEACT
Parameter Saving Mode	NO_SAVE
Max Response Time	When mode is multi-IP state, the max response time75 seconds. When mode is single state, and the state is IP INITIAL, the max response time is 160 seconds.
Reference	Note ● This command allows establishment of a TCP/UDP connection only when the state is IP_INITIAL or IP_STATUS or IP_CLOSED when it is in single state.In multi-IP state, the state is in IP_STATUS only,or,if the module is deactivating.So it is necessary to process "AT+CIPSHUT" before user establishes a TCP/UDP connection with this command when the state is not IP INITIAL or IP STATUS. ● When module is in multi-IP state, before this command is executed, it is necessary to process "AT+CSTT, AT+CIICR, AT+CIFSR".

7.2.3 AT+CIPSEND Send Data Through TCP or UDP Connection

AT+CIPSEND Send Data Through TCP or UDP Connection	
Test Command **AT+CIPSEND=?**	Response 1) For single IP connection (+CIPMUX=0)

	+CIPSEND: <length> **OK** 2) For multi IP connection (+CIPMUX=1) **+CIPSEND: (0-5),<length>** **OK**
	Parameters See Write Command
Read Command **AT+CIPSEND?**	Response 1) For single IP connection (+CIPMUX=0) **+CIPSEND: <size>** **OK** 2) For multi IP connection (+CIPMUX=1) **+CIPSEND: <n>,<size>** **OK**
	Parameters **<n>** A numeric parameter which indicates the connection number **<size>** A numeric parameter which indicates the data length sent at a time. The value of <**size**> is 1460 if the connection is successful; otherwise <**size**> is 0.
Write Command 1) If single IP connection (+CIPMUX=0) **AT+CIPSEND=<length>** 2) If multi IP connection (+CIPMUX=1) **AT+CIPSEND=<n>[,<length>]** response">", then tap data for send	Response This Command is used to send changeable length data If single IP is connected (+CIPMUX=0) If connection is not established or module is disconnected: If error is related to ME functionality: **+CME ERROR <err>** If sending is successful: When +CIPQSEND=0 **SEND OK** When +CIPQSEND=1 **DATA ACCEPT: <length>** If sending fails: **SEND FAIL** If multi IP connection is established (+CIPMUX=1) If connection is not established or module is disconnected: If error is related to ME functionality: **+CME ERROR <err>** If sending is successful: When +CIPQSEND=0 **<n>,SEND OK**

	When +CIPQSEND=1 **DATA ACCEPT: <n>,<length>** If sending fails: **<n>,SEND FAIL**
	Parameters **<n>** A numeric parameter which indicates the connection number **<length>** A numeric parameter which indicates the length of sending data, it must be less than <size>.
Execution Command 1)If single IP connection (+CIPMUX=0) **AT+CIPSEND** 2)If multi IP connection (+CIPMUX=1) **AT+CIPSEND=<n>** response">", then tap data for send, tap CTRL+Z to send, tap ESC to cancel the operation	Response This Command is used to send changeable length data. If single IP connection is established (+CIPMUX=0) If connection is not established or module is disconnected: If error is related to ME functionality: **+CME ERROR <err>** If sending is successful: When +CIPQSEND=0 **SEND OK** When +CIPQSEND=1 **DATA ACCEPT: <length>** If sending fails: **SEND FAIL** If multi IP connection is established (+CIPMUX=1) If connection is not established or module is disconnected: If error is related to ME functionality: **+CME ERROR <n>,<err>** If sending is successful: When +CIPQSEND=0 **<n>,SEND OK** When +CIPQSEND=1 **DATA ACCEPT: <n>,<length>** If sending fails: **<n>,SEND FAIL**
Parameter Saving Mode	NO_SAVE
Max Response Time	When +CIPQSEND=0 and the remote server no response, after 645 seconds, "CLOSE" will be reported.
Reference	Note ● The data length which can be sent depends on network status. ● Set the time that send data automatically with the command of AT+CIPATS. ● Only send data at the status of established connection**.**

7.2.4 AT+CIPQSEND Select Data Transmitting Mode

AT+CIPQSEND	Select Data Transmitting Mode
Test Command **AT+CIPQSEND=?**	Response **+CIPQSEND: (0,1)** **OK**
	Parameters See Write Command
Read Command **AT+CIPQSEND?**	Response **+CIPQSEND: <n>** **OK**
	Parameter See Write Command
Write Command **AT+CIPQSEND=<n>**	Response **OK**
	Parameters **<n>** 0 Normal mode.When the server receives TCP data, it will response **SEND OK**. 1 Quick send mode.When the data is sent by module, it will response **DATA ACCEPT: <length>**(For single IP connection (+CIPMUX=0)) or **DATA ACCEPT: <n>,<length>**(For multi IP connection (+CIPMUX=1)) while not responding **SEND OK**.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.5 AT+CIPACK Query Previous Connection Data Transmitting State

AT+CIPACK	Query Previous Connection Data Transmitting State
Test Command **AT+CIPACK=?**	Response **OK**
Write Command If in multi IP connection (+CIPMUX=1) **AT+CIPACK=<n>**	Response **+CIPACK: <txlen>,<acklen>,<nacklen>** **OK**
	Parameters **<n>** A numeric parameter which indicates the connection number

	<txlen> The data amount which has been sent **<acklen>** The data amount confirmed successfully by the server **<nacklen>** The data amount without confirmation by the server
Execution Command If in single IP connection (+CIPMUX=0) **AT+CIPACK**	Response **+CIPACK: <txlen>,<acklen>,<nacklen>** **OK**
	Parameters See Write Command
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.6 AT+CIPCLOSE Close TCP or UDP Connection

AT+CIPCLOSE	**Close TCP or UDP Connection**
Test Command **AT+CIPCLOSE=?**	Response **OK**
Write Command 1) If single IP connection (+CIPMUX=0) **AT+CIPCLOSE=<n>** 2) If multi IP connection (+CIPMUX=1) **AT+CIPCLOSE=<id>[,<n>]**	Response: 1) For single IP connection (+CIPMUX=0) **CLOSE OK** 2) For multi IP connection (+CIPMUX=1) **<id>,CLOSE OK**
	Parameters **<n>** Close type 0 Slow close 1 Quick close **<id>** A numeric parameter which indicates the connection number
Execution Command **AT+CIPCLOSE**	Response If close is successfully: **CLOSE OK** If close fails: **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	Note AT+CIPCLOSE only closes connection at corresponding status of TCP/UDP stack. To see the status use AT+CIPSTATUS command. Status should be: TCP CONNECTING, UDP CONNECTING, SERVER LISTENING or CONNECT OK in single-connection mode (see <**state**> parameter); CONNECTING or CONNECTED in multi-connection mode (see <**client state**>); OPENING or LISTENING in multi-connection mode (see <**server state**>). Otherwise it will return ERROR.

7.2.7 AT+CIPSHUT Deactivate GPRS PDP Context

AT+CIPSHUT Deactivate GPRS PDP Context	
Test Command **AT+CIPSHUT=?**	Response **OK**
Execution Command **AT+CIPSHUT**	Response If close is successful: **SHUT OK** If close fails: **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	65 seconds
Reference	Note ● If this command is executed in multi-connection mode, all of the IP connection will be shut. ● User can close gprs pdp context by AT+CIPSHUT. After it is closed, the status is IP INITIAL. ● If "+PDP: DEACT" urc is reported which means the gprs is released by the network, then user still needs to execute "AT+CIPSHUT" command to make PDP context come back to original state.

7.2.8 AT+CLPORT Set Local Port

AT+CLPORT Set Local Port	
Test Command **AT+CLPORT=?**	Response 1) For single IP connection (+CIPMUX=0) **+CLPORT: ("TCP","UDP"),(0-65535)** **OK** 2) For multi IP connection (+CIPMUX=1) **+CLPORT: (0-5),("TCP","UDP"),(0-65535)**

	OK
	Parameters See Write Command
Read Command **AT+CLPORT?**	Response 1) For single IP connection (+CIPMUX=0) **+CLPORT: <TCP port>,<UDP port>** **OK** 2) For multi IP connection (+CIPMUX=1) **+CLPORT: 0,<TCP port>,<UDP port>** **+CLPORT: 1,<TCP port>,<UDP port>** **+CLPORT: 2,<TCP port>,<UDP port>** **+CLPORT: 3,<TCP port>,<UDP port>** **+CLPORT: 4,<TCP port>,<UDP port>** **+CLPORT: 5,<TCP port>,<UDP port>** **OK**
	Parameters See Write Command
Write Command 1) For single IP connection (+CIPMUX=0) **AT+CLPORT=<mode>,<port>** 2) For multi IP connection (+CIPMUX=1) **AT+CLPORT=<n>,<mode>,<port>**	Response **OK** If set fail **ERROR**
	Parameters **<n>** 0..5 A numeric parameter which indicates the connection number this used in multi IP connection **<mode>** A string parameter which indicates the connection type "TCP" TCP local port "UDP" UDP local port **<port>** A numeric parameter which indicates the local port. A port can be dynamically allocated a port.If users want to set a port, the value is 1-65535. 0-65535 Port number
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note This command will be effective when module is set as a client.

7.2.9 AT+CSTT Start Task and Set APN,USER NAME,PASSWORD

AT+CSTT Start Task and Set APN,USER NAME,PASSWORD	
Test Command **AT+CSTT=?**	Response **+CSTT: "APN","USER","PWD"** **OK**
	Parameters See Write Command
Read Command **AT+CSTT?**	Response **+CSTT: <apn>,<user name>,<password>** **OK**
	Parameters See Write Command
Write Command **AT+CSTT=<apn>,<user name>,<password>**	Response **OK** If set fail **ERROR**
	Parameters **<apn>** A string parameter which indicates the GPRS access point name. The max length is 32 bytes.Defautl value is "ctnb".(option) **<user name>** A string parameter which indicates the GPRS user name. The max length is 32 bytes.(option) **<password>** A string parameter which indicates the GPRS password. The max length is 32 bytes.(option)
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Execution Command **AT+CSTT**	Response **OK** or **ERROR**
Reference	Note The write command and execution command of this command is valid only at the state of IP INITIAL. After this command is executed,the state will be changed to IP START.

7.2.10 AT+CIICR Bring Up Wireless Connection

AT+CIICR Bring Up Wireless Connection	
Test Command	Response

AT+CIICR=?	OK
Execution Command **AT+CIICR**	Response **OK** If bring up fail **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	85 seconds
Reference	Note ● AT+CIICR only activates moving scene at the status of IP START, after operating this Command is executed, the state will be changed to IP CONFIG. ● After module accepts the activated operation, if it is activated successfully, module state will be changed to IP GPRSACT, and it responds OK, otherwise it will respond **ERROR**.

7.2.11 AT+CIFSR Get Local IP Address

AT+CIFSR Get Local IP Address	
Test Command **AT+CIFSR=?**	Response **OK**
Execution Command **AT+CIFSR**	Response **<IP address>** If get fail **ERROR**
	Parameter **<IP address>** A string parameter which indicates the IP address assigned from GPRS or CSD.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note Only after PDP context is activated, local IP address can be obtained by AT+CIFSR, otherwise it will respond ERROR. To see the status use AT+CIPSTATUS command. Status should be: IP GPRSACT, TCP CONNECTING, UDP CONNECTING, SERVER LISTENING, IP STATUS, CONNECT OK, TCP CLOSING, UDP CLOSING, TCP CLOSED, UDP CLOSED in single-connection mode (see <state> parameter); IP STATUS, IP PROCESSING in multi-connection mode (see <state> parameter).

7.2.12 AT+CIPSTATUS Query Current Connection Status

AT+CIPSTATUS	Query Current Connection Status
Test Command **AT+CIPSTATUS=?**	Response **OK**
Write Command If multi IP connection mode (+CIPMUX=1) **AT+CIPSTATUS=<n>**	Response **+CIPSTATUS: <n>,<bearer>,<TCP/UDP>,<IP address>,<port>,<client state>** **OK**
	Parameters See Execution Command
Execution Command **AT+CIPSTATUS**	Response 1）If in single connection mode (+CIPMUX=0) **OK** **STATE: <state>** 2) If in multi-connection mode (+CIPMUX=1) **OK** **STATE: <state>** If the module is set as server **S: 0,<bearer>,<port>,<server state>** If the module is set as client **C: <n>,<bearer>,<TCP/UDP>,<IP address>,<port>,<client state>**
	Parameters **<n>** 0-5 A numeric parameter which indicates the connection number **<bearer>** 1 GPRS bearer, default is null **<server state>** Server state OPENING LISTENING CLOSING **<client state>** Client state INITIAL CONNECTING CONNECTED REMOTE CLOSING CLOSING CLOSED **<state>** A string parameter which indicates the progress of connecting

	0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 TCP CONNECTING/UDP CONNECTING /SERVER LISTENING 6 CONNECT OK 7 TCP CLOSING/UDP CLOSING 8 TCP CLOSED/UDP CLOSED 9 PDP DEACT In Multi-IP state: 0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 IP PROCESSING 9 PDP DEACT
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.13 AT+CDNSCFG Configure Domain Name Server

AT+CDNSCFG	**Configure Domain Name Server**
Test Command **AT+CDNSCFG=?**	Response **+CDNSCFG: ("Primary DNS"),("Secondary DNS")** **OK**
	Parameters See Write Command
Read Command **AT+CDNSCFG?**	Response **PrimaryDns: <pri_dns>** **SecondaryDns: <sec_dns>** **OK**
	Parameter See Write Command
Write Command	Response

AT+CDNSCFG=<pri_dns>[,<sec_dns>]	**OK** **ERROR**
	Parameters **<pri_dns>** A string parameter which indicates the IP address of the primary domain name server. Default value is 208.67.222.222. <**sec_dns**> A string parameter which indicates the IP address of the secondary domain name server. Default value is 0.0.0.0. When you are on the network,<**pri_dns**><**sec_dns**> will use the DNS server address from the network, and the default DNS server address if the network is not.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.14 AT+CDNSGIP Query the IP Address of Given Domain Name

AT+CDNSGIP Query the IP Address of Given Domain Name	
Test Command **AT+CDNSGIP=?**	Response **OK**
Write Command **AT+CDNSGIP=<domain name>**	Response **OK** If query fail **ERROR** If successful, return: **+CDNSGIP: 1,<domain name>,<IP1>[,<IP2>]** If fail, return: **+CDNSGIP: 0,<dns error code>**
	Parameters **<domain name>** A string parameter which indicates the domain name **<IP1>** A string parameter which indicates the first IP address corresponding to the domain name **<IP2>** A string parameter which indicates the second IP address corresponding to the domain name **<dns error code>** A numeric parameter which indicates the error code 8 DNS COMMON ERROR 3 NETWORK ERROR There are some other error codes as well.
Parameter Saving Mode	NO_SAVE

Max Response Time	-
Reference	Note

7.2.15 AT+CIPHEAD Add an IP Head at the Beginning of a Package Received

AT+CIPHEAD Add an IP Head at the Beginning of a Package Received	
Test Command **AT+CIPHEAD=?**	Response **+CIPHEAD: (**list of supported **<mode>**s**)** **OK**
	Parameter See Write Command
Read Command **AT+CIPHEAD?**	Response **+CIPHEAD: <mode>** **OK**
	Parameters See Write Command
Write Command **AT+CIPHEAD=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** A numeric parameter which indicates whether an IP header is added to the received data or not. 0 Not add IP header 1 Add IP header, the format is: 1) For single IP connection (+CIPMUX=0) **+IPD,<data length>:** 2) For multi IP connection (+CIPMUX=1) **+RECEIVE,<n>,<data length>:**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.16 AT+CIPHEXS Show Data in Hex Mode of a Package Received

AT+CIPHEXS Show Data in Hex Mode of a Package Received

Read Command **AT+CIPHEXS?**	Response **+CIPHEXS: <mode>** **OK**
	Parameters See Write Command
Write Command **AT+CIPHEXS=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** A numeric parameter which indicates whether show data in hex mode or not. 0-1 Not show data in hex mode. 2 Show data in hex mode. While AT+CIPHEAD=1, if<mode>=1 or 2: add 0d0a at the end of data.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	The command is effective only if AT+CIPRXGET=0.

7.2.17 AT+CIFSREX Get Local IP Address

AT+CIFSREX Get Local IP Address	
Test Command **AT+CIFSREX=?**	Response **OK**
Execution Command **AT+CIFSREX**	Response **+CIFSREX: <IP address>** **OK** or **ERROR**
	Parameter **<IP address>** A string parameter which indicates the IP address assigned from GPRS or CSD.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

	Only after PDP context is activated, local IP address can be obtained by AT+CIFSREX, otherwise it will respond ERROR. To see the status use AT+CIPSTATUS command. Status should be: IP GPRSACT, TCP CONNECTING, UDP CONNECTING, SERVER LISTENING, IP STATUS, CONNECT OK, TCP CLOSING, UDP CLOSING, TCP CLOSED, UDP CLOSED in single-connection mode (see <state> parameter); IP STATUS, IP PROCESSING in multi-connection mode (see <state> parameter).

7.2.18 AT+CIPATS Set Auto Sending Timer

AT+CIPATS Set Auto Sending Timer	
Test Command **AT+CIPATS=?**	Response **+CIPATS: (**list of supported **<mode>**s**),(**list of supported **<time>**) **OK**
	Parameters See Write Command
Read Command **AT+CIPATS?**	Response **+CIPATS: <mode>,<time>** **OK**
	Parameters See Write Command
Write Command **AT+CIPATS=<mode>[,<time>]**	Response **OK** or **ERROR**
	Parameters **<mode>** A numeric parameter which indicates whether set timer when module is sending data 0 Not set timer when module is sending data 1 Set timer when module is sending data **<time>** A numeric parameter which indicates the seconds after which the data will be sent. If <mode> is 1, <time> is 1-100. otheriwse <time> is 0.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.19 AT+CIPSPRT Set Prompt of '>' When Module Sends Data

AT+CIPSPRT Set Prompt of '>' When Module Sends Data	
Test Command **AT+CIPSPRT=?**	Response **+CIPSPRT: (**list of supported **<send prompt>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CIPSPRT?**	Response **+CIPSPRT: <send prompt>** **OK**
	Parameters See Write Command
Write Command **AT+CIPSPRT=<send prompt>**	Response **OK** or **ERROR**
	Parameters **<send prompt>** A numeric parameter which indicates whether to echo prompt '>' after module issues AT+CIPSEND command. 0 It shows "send ok" but does not prompt echo '>' when sending is successful. 1 It prompts echo '>' and shows "send ok" when sending is successful. 2 It neither prompts echo '>' nor shows "send ok" when sending is successful.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.20 AT+CIPCSGP Set CSD or GPRS for Connection Mode

AT+CIPCSGP Set CSD or GPRS for Connection Mode	
Test Command **AT+CIPCSGP=?**	Response **+CIPCSGP: 0-CSD,DIALNUMBER,USER NAME,PASSWORD,RATE(0-3)** **+CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD**

	OK
	Parameters See Write Command
Read Command **AT+CIPCSGP?**	Response **+CIPCSGP: <mode>,<apn>,<user name>,<password>[,<rate>]** **OK**
	Parameters See Write Command
Write Command **AT+CIPCSGP=<mode>[,(<apn>,<user name>,<password>),(<dial number>,<user name>,<password>,<rate>)]**	Response **OK** or **ERROR**
	Parameters **<mode>** A numeric parameter which indicates the wireless connection mode 0 Set CSD as wireless connection mode 1 Set GPRS as wireless connection mode GPRS parameters: **<apn>** A string parameter which indicates the access point name **<user name>** A string parameter which indicates the user name **<password>** A string parameter which indicates the password CSD parameters. **<dial number>** A string parameter which indicates the CSD dial numbers **<user name>** A string parameter which indicates the CSD user name **<password>** A string parameter which indicates the CSD password **<rate>** A numeric parameter which indicates the CSD connection rate 0 2400 1 4800 2 9600 3 14400
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.21 AT+CIPSRIP Show Remote IP Address and Port When Received Data

AT+CIPSRIP Show Remote IP Address and Port When Received Data	
Test Command **AT+CIPSRIP=?**	Response **+CIPSRIP: (**list of supported **<mode>**s**)**

	OK
	Parameters See Write Command
Read Command **AT+CIPSRIP?**	Response **+CIPSRIP**: **<mode>** **OK**
	Parameters See Write Command
Write Command **AT+CIPSRIP=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** A numeric parameter which shows remote IP address and port. 0 Do not show the prompt 1 Show the prompt, the format is as follows: 1) For single IP connection (+CIPMUX=0) **+RECV FROM: <IP ADDRESS>:<PORT>** 2) For multi IP connection (+CIPMUX=1) **+RECEIVE,<n>,<data length>,<IP ADDRESS>:<PORT>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

7.2.22 AT+CIPSHOWTP Display Transfer Protocol in IP Head When Received Data

AT+CIPSHOWTP Display Transfer Protocol in IP Head When Received Data	
Test Command **AT+CIPSHOWTP=?**	Response **+CIPSHOWTP: (**list of supported **<mode>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CIPSHOWTP?**	Response **+CIPSHOWTP: <mode>** **OK**

	Parameters See Write Command
Write Command **AT+CIPSHOWTP=<mode>**	Response **OK** or **ERROR**
	Parameters **<mode>** A numeric parameter which indicates whether to display transfer protocol in IP header to received data or not 0 Not display transfer protocol 1 Display transfer protocol, the format is "+IPD,<data size>,<TCP/UDP>:<data>"
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● This command will be effective only in single connection mode (+CIPMUX=0). ● Only when +CIPHEAD is set to 1, the setting of this command will work.

7.2.23 AT+CIPUDPMODE UDP Extended Mode

AT+CIPUDPMODE UDP Extended Mode	
Test Command **AT+CIPUDPMODE=?**	Response 1) For single IP connection (+CIPMUX=0) **+CIPUDPMODE: (0-2),("(0-255).(0-255).(0-255).(0-255)"),(0-65535)** **OK** 2) For multi IP connection (+CIPMUX=1) **+CIPUDPMODE:** **(0-5),(0-2),("(0-255).(0-255).(0-255).(0-255)"),(0-65535)** **OK**
	Parameters See Write Command
Read Command **AT+CIPUDPMODE?**	Response 1) For single IP connection (+CIPMUX=0) **+CIPUDPMODE: <mode>[,<IP address>,<Port>]** **OK** 2) For multi IP connection (+CIPMUX=1)

	+CIPUDPMODE: 0,<mode>[,<IP address>,<Port>] **+CIPUDPMODE: 1,<mode>[,<IP address>,<Port>]** **+CIPUDPMODE: 2,<mode>[,<IP address>,<Port>]** **+CIPUDPMODE: 3,<mode>[,<IP address>,<Port>]** **+CIPUDPMODE: 4,<mode>[,<IP address>,<Port>]** **+CIPUDPMODE: 5,<mode>[,<IP address>,<Port>]** **OK**
	Parameters See Write Command
Write Command 1) For single IP connection (+CIPMUX=0) **AT+CIPUDPMODE=<mode>[,<IP address>,<Port>]** 2) For multi IP connection (+CIPMUX=1) **AT+CIPUDPMODE=<n>,<mode>[,<IP address>,<Port>]**	Response **OK** or **ERROR**
	Parameters **<n>** A numeric parameter which indicates the connection number. 0-5 **<mode>** Mode type 0 UDP Normal Mode 1 UDP Extended Mode 2 Set UDP address to be sent **<IP address>** A string parameter which indicates remote IP address **<port>** Remote port. Default value is 0, if users want to set a port; the value is 1-65535.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

7.2.24 AT+CIPRXGET Get Data from Network Manually

AT+CIPRXGET	**Get Data from Network Manually**
Test Command **AT+CIPRXGET=?**	Response If single IP connection (+CIPMUX=0) **+CIPRXGET: (**list of supported **<mode>**s**),(**list of supported **<reqlength>)** **OK** If multi IP connection (+CIPMUX=1) **+CIPRXGET: (**list of supported **<mode>**s**),(**list of supported **<id>**s**),(**list of supported **<reqlength>)**

	OK
	Parameters See Write Command
Read Command **AT+CIPRXGET?**	Response **+CIPRXGET: <mode>** **OK**
	Parameters See Write Command
Write Command 1) If single IP connection (+CIPMUX=0) **AT+CIPRXGET=<mode>[,<reqlength>]** 2) If multi IP connection (+CIPMUX=1) **AT+CIPRXGET=<mode>[,<id>[,<reqlength>]]**	Response **OK** or **ERROR** 1)For single IP connection If "AT+CIPSRIP=1" is set, IP address and port are contained. if <mode>=1 **+CIPRXGET: 1[,<IP ADDRESS>:<PORT>]** if <mode>=2 **+CIPRXGET: 2,<reqlength>,<cnflength>[,<IP ADDRESS>:<PORT>]** **1234567890…** **OK** if <mode>=3 **+CIPRXGET: 3,<reqlength>,<cnflength>[,<IP ADDRESS>:<PORT>]** **5151…** **OK** if <mode>=4 **+CIPRXGET: 4,<cnflength>** **OK** 2)For multi IP connection If "AT+CIPSRIP=1" is set, IP address and port is contained. if <mode>=1 **+CIPRXGET: 1,<id>[,<IP ADDRESS>:<PORT>]** if <mode>=2 **+CIPRXGET: 2,<id>,<reqlength>,<cnflength>[,<IP ADDRESS>:<PORT>]** **1234567890…** **OK** if <mode>=3 **+CIPRXGET: 3,<id>,<reqlength>,<cnflength>[,<IP**

	ADDRESS>:<PORT>] **5151…** **OK** if <mode>=4 **+CIPRXGET: 4,<id>,<cnflength>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<mode>** 0 Disable getting data from network manually, the module is set to normal mode, data will be pushed to TE directly. 1 Enable getting data from network manually. 2 The module can get data, but the length of output data can not exceed 1460 bytes at a time. 3 Similar to mode 2, but in HEX mode, which means the module can get 730 bytes maximum at a time. 4 Query how many data are not read with a given ID. **<id>** A numeric parameter which indicates the connection number **<reqlength>** Requested number of data bytes (1-1460 bytes)to be read **<cnflength>** Confirmed number of data bytes to be read, which may be less than <length>. 0 indicates that no data can be read.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note To enable this function, parameter <mode> must be set to 1 before connection.

7.2.25 AT+CIPTKA Set TCP Keepalive Parameters

AT+CIPTKA Set TCP Keepalive Parameters	
Test Command **AT+CIPTKA=?**	Response If single IP connection (+CIPMUX=0) **+CIPTKA:** (list of supported **<mode>**s)**,**(list of supported **<keepIdle>**s)**,**(list of supported **<keepInterval>**)**,**(list of supported **<keepCount>**s) If multi IP connection (+CIPMUX=1) **+CIPTKA:** (list of supported **<id>**s)**,**(list of supported **<mode>**s)**,**(list of supported **<keepIdle>**s)**,**(list of supported **<keepInterval>**)**,**(list of s upported **<keepCount>**s)

	OK
	Parameters See Write Command
Read Command **AT+CIPTKA?**	Response If single IP connection (+CIPMUX=0) **+CIPTKA: <mode>[,<keepIdle>,<keepInterval>,<keepCount>]** If multi IP connection (+CIPMUX=1) **+CIPTKA: 0,<mode>[,<keepIdle>,<keepInterval>,<keepCount>]** **+CIPTKA: 1,<mode>[,<keepIdle>,<keepInterval>,<keepCount>]** **+CIPTKA: 2,<mode>[,<keepIdle>,<keepInterval>,<keepCount>]** **+CIPTKA: 3,<mode>[,<keepIdle>,<keepInterval>,<keepCount>]** **+CIPTKA: 4,<mode>[,<keepIdle>,<keepInterval>,<keepCount>]** **+CIPTKA: 5,<mode>[,<keepIdle>,<keepInterval>,<keepCount>]** **OK**
	Parameters See Write Command
Write Command 1)If single IP connection (+CIPMUX=0) **AT+CIPTKA=<mode>[,<keepIdle>[,<keepInterval>[,<keepCount>]]]** 2) If multi IP connection (+CIPMUX=1) **AT+CIPTKA=<n>,<mode>[,<keepIdle>[,<keepInterval>[,<keepCount>]]]**	Response **OK** If error is related to ME functionality: **ERROR**
	Parameters **<n>** A numeric parameter which indicates the connection 0-5 **<mode>** Set TCP keepalive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism **<keepIdle>** Integer type; Idle time (in second) before TCP send the initial keepalive probe. 30-7200 Default: 7200 **<keepInterval>** Interval time (in second) between keepalive probes retransmission. 30-600 Default: 75 **<keepCount>** Integer type; Maximum number of keepalive probes to be sent. 1-9 Default: 9
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

	If <**keepIdle**>,<**keepInterval**> and <**keepCount**> is not set,module will use the default values when <**mode**>=1.

7.2.26 AT+CIPMODE Open Transparent Mode

AT+CIPMODE Open Transparent Mode	
Test Command **AT+CIPMODE=?**	Response **+CIPMODE: (0-NORMAL MODE,1-TRANSPARENT MODE)** **OK**
	Parameters See Write Command
Read Command **AT+CIPMODE?**	Response **+CIPMODE: <mode>** **OK**
	Parameters See Write Command
Execution Command **AT+CIPMODE=<mode>**	Response **OK** If set fail **ERROR**
	Parameters **<mode>** Transparent mode 0 Disable transparent mode 1 Enable transparent mode
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	● The execution command of this command is valid only activates moving scene at the status of IP_INITIAL or IP_CLOSED ● The execution command of this command is valid only for single connection

7.2.27 AT+CIPCHAN Enter Transparent Mode

AT+CIPCHAN Enter Transparent Mode	
Test Command **AT+CIPCHAN=?**	Response **OK**

Execution Command **AT+CIPCHAN**	Response **CONNECT** or **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● This command is executed in single-connection mode. ● Before execute this command, "AT+CIPMODE=1" must be executedand and the connection must be established successfully. ● When module is in transparent mode, if user tapped "+++", module would exit transparent mode. ● When user tapped "+++" to exit transparent mode, user can execute the command of "ATO" to return transparent mode.

8 AT Commands for HTTP/HTTPS Client

8.1 Overview of AT Commands for HTTP/HTTPS Client

Command	Description
AT+CHTTPCREATE	Create a HTTP/HTTPS client instance
AT+CHTTPCREATEEXT	Create a HTTP/HTTPS client instance by multi packages for a long size command
AT+CHTTPCON	Establish the HTTP/HTTPS connection
AT+CHTTPDISCON	Close the HTTP/HTTPS connection
AT+CHTTPDESTROY	Destroy the HTTP/HTTPS client instance
AT+CHTTPSEND	Send HTTP/HTTPS package
AT+CHTTPSENDEXT	Send HTTP/HTTPS package by multi packages for a long size command
AT+CHTTPPARA	Set parmeter for AT command of AT+CHTTPSEND
AT+CHTTPTOFS	Download File to Module System
AT+CHTTPCLRMULCRTBUF	Clear multi create buffer of AT+CHTTPCREATEEXT
AT+CHTTPCLRMULSNDBUF	Clear multi send buffer of AT+CHTTPSENDEXT
AT+CHTTPRESUMESEND	Set resume send package or not when HTTP disconnected
+CHTTPNMIH	Header of the response from host
+CHTTPNMIC	Content of the response from host
+CHTTPERR	HTTP/HTTPS client connection error indicator
+CHTTPTOFS	HTTP download indicate from host
+CHTTPTOFSOK	HTTP download finished indicate

8.2 Detailed Descriptions of AT Commands for HTTP/HTTPS Client

8.2.1 AT+CHTTPCREATE Create a HTTP/HTTPS Client Instance

AT+CHTTPCREATE Create a HTTP/HTTPS Client Instance	
Read Command **AT+CHTTPCREATE?**	Response **+CHTTPCREATE: <httpclient_id>,<state>,<host>[<CR><LF>** **+CHTTPCREATE: <httpclient_id>,<state>,<host>** **[...]]** **OK**

	Parameters See Write Command
Write Command **AT+CHTTPCREATE=<host>[,<auth_user>,<auth_password>**	Response Create an HTTP or HTTPS client instance and set configuration. If the <host> is start with "https://", our device will create an HTTPS client. **+CHTTPCREATE: <httpclient_id>** **OK** or **ERROR**
	Parameters <**host**> HTTP server host <**auth_user**> Authorization name [option] <**auth_password**> Authorization password [option] All optional parameter should be exist or not exist in one command. <**httpclient_id**> An indicator of HTTP client instance created by the command. <**state**> The create state of the httpclient_id 1 Sucessfully 0 Failed
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

8.2.2 AT+CHTTPCREATEEXT Create a HTTP/HTTPS Client Instance by Multi Packages for a Long Size Command

AT+CHTTPCREATEEXT Create a HTTP/HTTPS Client Instance by Multi Packages for a Long Size Command	
Read Command **AT+CHTTPCREATEEXT?**	Response **+CHTTPCREATEEXT: <httpclient_id>,<state>,<host>[<CR><LF>** **+CHTTPCREATEEXT: <httpclient_id>,<state>,<host>** **[...]]** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPCR**	Response Create an HTTP or HTTPS client instance and set configuration. If the

EATEEXT=<flag>,<total_len>,<len>,<host>[<auth_user>,<auth_password>,<server_cert_len>,<server_cert>,<client_cert_len>,<client_cert>,<client_pk_len>,<client_pk>]	<host> is start with "https://", our device will create an HTTPS client. **+CHTTPCREATEEXT: <httpclient_id>** **OK** or **ERROR**
	Parameters **<flag>** 1 Means there are more packages, 0 Means this package is the last one **<total_len>** The total length of the command **<len>** The length of current package <**host**> HTTP server host <**auth_user**> Authorization name [option] <**auth_password**> Authorization password [option] **<server_cert_len>** Server certification length, for https [option] <**server_cert**> Server certification, for https [option] **<client_cert_len>** Client certification length, for https [option] <**client_cert**> Client certification, for https [option] **<client_pk_len>** Client private key length, for https [option] <**client_pk**> Client private key, for https [option] All optional parameter should be exist or not exist in one command. <**httpclient_id**> An indicator of HTTP client instance created by the command. <**state**> The create state of the httpclient_id 1 Sucessfully 0 Failed
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

8.2.3 AT+CHTTPCON Establish the HTTP/HTTPS Connection

AT+CHTTPCON Establish the HTTP/HTTPS Connection	
Test Command **AT+CHTTPCON=?**	Response **+CHTTPCON: (0-4)** **OK**
	Parameters

	See Write Command
Read Command **AT+CHTTPCON?**	Response **+CHTTPCON: <httpclient_id>,<con_state>,<host>[<CR><LF>** **+CHTTPCON: <httpclient_id>,<con_state>,<host>** **[...]]** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPCON=<httpclient_id>**	Response Use the created HTTP instance to connect to target host. **OK** or **ERROR**
	Parameters <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command **<con_state>** The connected state of the httpclient_id 1 OK 0 FAIL <**host**> HTTP server host
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CHTTPCREATE should be set before this command.

8.2.4 AT+CHTTPDISCON Close the HTTP/HTTPS Connection

AT+CHTTPDISCON Close the HTTP/HTTPS Connection	
Test Command **AT+CHTTPDISCON=?**	Response **+CHTTPDISCON: (0-4)** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPDISCON=<httpclient_id>**	Response Use the created HTTP instance to disconnect the connection with host. After disconnected and before detroy the HTTP instance, you can use AT+CHTTPCON to connect it again. **OK** or

	ERROR
	Parameters <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CHTTPCON should be set before this command

8.2.5 AT+CHTTPDESTROY Destroy the HTTP/HTTPS Client Instance

AT+CHTTPDESTROY Destroy the HTTP/HTTPS Client Instance	
Test Command **AT+CHTTPDESTROY=?**	Response **+CHTTPDESTROY: (0-4)** **OK**
	Parameters See Write Command
Read Command **AT+CHTTPDESTROY?**	Response **+CHTTPDESTROY:** **<httpclient_id>,<state>,<host>[<CR><LF>+CHTTPDESTROY:** **<httpclient_id>,<state>,<host>** **[...]]** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPDESTROY=<httpclient_id>**	Response Use the created HTTP instance to disconnect the connection with host. **OK** or **ERROR**
	Parameters <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command. <**state**> The create state of the httpclient_id 1 Sucessfully 0 Failed <**host**> HTTP server host
Parameter Saving	NO_SAVE

Mode	
Max Response Time	-
Reference	Note ● AT+CHTTPCREATE should be set before this command

8.2.6 AT+CHTTPSEND Send HTTP/HTTPS Package

AT+CHTTPSEND Send HTTP/HTTPS Package	
Test Command **AT+CHTTPSEND=?**	Response **+CHTTPSEND: (0-4),(0-3),"path","http header","http content type","http content"** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPSEND=<httpclient_id>,<method>,<path>[,<customer_header>,<content_type>,<content_string>]**	Response **OK** or **ERROR**
	Parameters <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command. <**method**> HTTP method 0 HTTPCLIENT_GET 1 HTTPCLIENT_POST 2 HTTPCLIENT_PUT 3 HTTPCLIENT_DELETE <**path**> The resource path on server, ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html". <**customer_header**> The string converted from customer header hex data. <**content_type**> A string indicate the content type of the content, if the method is not POST and PUT, it must be empty. <**content_string**> The string converted from content hex data.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CHTTPCON should be set before this command

8.2.7 AT+CHTTPSENDEXT Send HTTP/HTTPS Package by Multi Packages for a Long Size Command

AT+CHTTPSENDEXT Send HTTP/HTTPS Package by Multi Packages for a Long Size Command	
Test Command **AT+CHTTPSENDEXT=?**	Response **+CHTTPSENDEXT: (0-1),"total_len","current_len",(0-4),(0-3),"path_len","path","header_len","header","content_type_len","content_type","content_string_len","content_string"** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPSENDEXT=<flag>,<total_len>,<len>,<httpclient_id>,<method>,<path_len>,<path>,<customer_header_len>,<customer_header>,<content_type_len>,<content_type_len>,<content_string_len>,<content_string>**	Response **OK** or **ERROR**
	Parameters <**flag**> 1 Means there are more packages 0 Means this package is the last one **<total_len>** The total length of the command <**len**> The length of current package <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command. <**method**> HTTP method 0 HTTPCLIENT_GET 1 HTTPCLIENT_POST 2 HTTPCLIENT_PUT 3 HTTPCLIENT_DELETE **<path_len>** length of path <**path**> The resource path on server, ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html". **<customer_header_len>** Length of customer_header <**customer_header**> The string converted from customer header hex data. **<content_type_len>** The length of Content_type <**content_type**> A string indicate the content type of the content, if the method is not POST and PUT, it must be empty. **<content_string_len>** The length of Content_string <**content_string**> The string converted from content hex data.
Parameter Saving Mode	NO_SAVE

Max Response Time	-
Reference	Note ● AT+CHTTPCON should be set before this command

8.2.8 AT+CHTTPPARA Set Parmeter for AT Command of AT+CHTTPSEND

AT+CHTTPPARA Set Parmeter for AT Command of AT+CHTTPSEND	
Test Command **AT+CHTTPPARA=?**	Response **+CHTTPPARA: (0-1)** **OK**
	Parameters See Write Command
Read Command **AT+CHTTPPARA?**	Response **+CHTTPPARA: <value>** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPPARA=<value>**	Response **OK** or **ERROR**
	Parameters <**value**> The parameter for sending 1 Can send AT+CHTTPSEND continuously 0 Can not send AT+CHTTPSEND continuously, until the server reponse
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Note Use this command for setting send parameter, so that you can send "AT+CHTTPSEND" continuously, and no care of the response.

8.2.9 AT+CHTTPTOFS Download File to Module System

AT+CHTTPTOFS Download File to Module System	
Test Command **AT+CHTTPTOFS=?**	Response **+CHTTPTOFS: (0-4),"path"**

	OK
	Parameters See Write Command
Write Command **AT+CHTTPTOFS=<httpclient_id>,<path>**	Response Use the created HTTP instance to connect to target host. **OK** or **ERROR**
	Parameters <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command **<path>** The resource path on server, it should begin with "/". ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html".
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CHTTPCON should be set before this command.

8.2.10 AT+CHTTPCLRMULCRTBUF Clear Multi Create Buffer of AT+CHTTPCREATEEXT

AT+CHTTPCLRMULCRTBUF Clear Multi Create Buffer of AT+CHTTPCREATEEXT	
Execution Command **AT+CHTTPCLRMULCRTBUF**	Response **OK** or **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● Clear multi create buffer of AT+CHTTPCREATEEXT. When you do not AT+CHTTPCREATEEXT the last package, but you want to AT+CHTTPCREATEEXT the new command, you can AT+CHTTPCLRMULCRTBUF.

8.2.11 AT+CHTTPCLRMULSNDBUF Clear Multi Send Buffer of AT+CHTTPSENDEXT

AT+CHTTPCLRMULSNDBUF Clear Multi Send Buffer of AT+CHTTPSENDEXT	
Execution Command **AT+CHTTPCLRMULSNDBUF**	Response **OK** or **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● Clear multi send buffer of AT+CHTTPSENDEXT. When you do not AT+CHTTPSENDEXT the last package, but you want to AT+CHTTPSENDEXT the new command, you can AT+CHTTPCLRMULSNDBUF.

8.2.12 AT+CHTTPRESUMESEND Set Resume Send Package or not when HTTP Disconnected

AT+CHTTPRESUMESEND Set Resume Send Package or not when HTTP Disconnected	
Test Command **AT+CHTTPRESUMESEND=?**	Response **+CHTTPRESUMESEND: (0-1)** **OK**
	Parameters See Write Command
Read Command **AT+CHTTPRESUMESEND?**	Response **+CHTTPRESUMESEND: <value>** **OK**
	Parameters See Write Command
Write Command **AT+CHTTPRESUMESEND=<value>**	Response **OK** or **ERROR**
	Parameters <**value**> Resume send package or not when HTTP disconnected. 1 Can resume send packages by AT+CHTTPSENDEXT when HTTP disconnected 0 Can not resume send packages by AT+CHTTPSENDEXT when

	HTTP disconnected. Once HTTP disconnected, multi send buffer of AT+CHTTPSENDEXT is cleared automatically, you should always AT+CHTTPSENDEXT the first package
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

8.2.13 +CHTTPNMIH Header of the Response from Host

+CHTTPNMIH	**Header of the Response from Host**
	Response The response from host has 2 parts. This is the header part and content part will follow this URC. **+CHTTPNMIH:** **<httpclient_id>,<response_code>,<header_length>,<header>**
	Parameters <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command. <**response_code**> The HTTP response code 100 Continue 101 Switching Protocols 200 OK 201 Created 202 Accepted 203 Non-Authoritative Information 204 No Content 205 Reset Content 206 Partial Content 300 Multiple Choices 301 Moved Permanently 302 Found 303 See Other 304 Not Modified 305 Use Proxy 307 Temporary Redirect 400 Bad Request 401 Unauthorized 402 Payment Required 403 Forbidden 404 Not Found 405 Method Not Allowed

	406 Not Acceptable 407 Proxy Authentication Required 408 Request Time-out 409 Conflict 410 Gone 411 Length Required 412 Precondition Failed 413 Request Entity Too Large 414 Request-URI Too Large 415 Unsupported Media Type 416 Requested range not satisfiable 417 Expectation Failed 500 Internal Server Error 501 Not Implemented 502 Bad Gateway 503 Service Unavailable 504 Gateway Time-out 505 HTTP Version not supported <**header_length**> The length (buffer size) of the header string <**header**> Header data of response

8.2.14 +CHTTPNMIC Content of The Response from Host

+CHTTPNMIC	**Content of The Response from Host**
	Response The response from host has 2 parts. This is the content part and follows by the header part URC. And there are multi content URC follow one header URC. **+CHTTPNMIC:** **<httpclient_id>,<flag>,<total_length><content_package_len>,<content_package_string>**
	Parameters <**httpclient_id**> The indicator of HTTP client instance created by the AT+CHTTPCREATE command. <**flag**> The flag to indicate if there are more data of the HTTP content. 1 Means there are more packages 0 Means this package is the last one <**total_length**> The total length of the content. It is get from header "Content-Length: xxx", so if the response is not 200 OK, maybe the value is -1. <**content_package_len**> Content data length of current URC. <**content_package_string**> Content data string which is converted from content hex data.The length must be original content hex data size/2.

8.2.15 +CHTTPERR HTTP Client Connection Error Indicator

+CHTTPERR HTTP Client Connection Error Indicator	
	Response When the URC send, there is some error happen on the HTTP client. Normally is TCP connection is disconnected. **+CHTTPERR: <httpclient_id>[,<error_code>]**
	Parameters **<httpclient_id>** The indicator of HTTP client instance created by the AT+CHTTPCREATE command **<error_code>** -1 Means disconnected -2 Connection was closed by a remote host. -3 An unknown error occurred. -4 A protocol error occurred. -5 Could not resolve the hostname. -6 A URL parse error occurred. If the URC send out, the HTTP client will be disconnected automatically. If user want to send HTTP message to server, he must use AT+CHTTPCON command to connect.

8.2.16 +CHTTPTOFS HTTP Download Indicate from Host

+CHTTPTOFS HTTP Download Indicate from Host	
	Response HTTP download progress indicate **+CHTTPTOFS: <httpclient_id>,<flag>,<content_len>,<len>**
	Parameters **<httpclient_id>** The indicator of HTTP client instance created by the AT+CHTTPCREATE command **<flag>** The flag to indicate if there are more data of the HTTP content 1 Means there are more packages 0 Means this package is the last one **<content_len>** Total length of content data **<len>** The length of all downloaded content data

8.2.17 +CHTTPTOFSOK HTTP Download Finished Indicate

+CHTTPTOFSOK HTTP Download Finished Indicate	
	Response **+CHTTPTOFSOK: <httpclient_id>,<contend_len>,<len>**
	Parameters **<httpclient_id>** The indicator of HTTP client instance created by the

	AT+CHTTPCREATE command **<contend_len>** Total length of content data **<len>** The length of all downloaded content data

9 AT Commands for PING Support

9.1 Overview of AT Commands for PING Support

Command	Description
AT+CIPPING	Test IP network connectivity to a remote host

9.2 Detailed Descriptions of AT Commands for PING Support

9.2.1 AT+CIPPING Test IP Network Connectivity to A Remote Host

AT+CIPPING Test IP Network Connectivity to A Remote Host	
Test Command **AT+CIPPING=?**	Response **+CIPPING: (**list of supported **<retryNum>**s**),(**list of supported <**dataLen**>s**),(**list of supported <**timeout**>s**)** **OK**
	Parameters See Write Command
Read Command **AT+CIPPING?**	Response **+CIPPING: <retryNum>,<dataLen>,<timeout>** **OK**
	Parameters See Write Command
Write Command **AT+CIPPING=<IPaddr>[,<retryNum>[,<dataLen>[,<timeout>]]]**	Response **OK** **+CIPPING**: **<replyId>,<IpAddress>,<replyTime>,<ttl>[<CR><LF>+CIPPING**: **<replyId>,<IpAddress>,<replyTime>,<ttl>** **[...]]** or **BUSY** (When previous comand unfinished, AT+CIPPING agian) or **ERROR** or **+CME ERROR: <err>**
	Parameters <**IPaddr**> IP address of the remote host,string type.

	<retryNum> The number of Ping Echo Requset to send 1-100 Default: 4 **<dataLen>** The length of Ping Echo Request data 0-5120 Default: 32 <**timeout**> The timeout,in units of 100 ms,waiting for a single Echo Reply 1-600 Default: 100(10 seconds) <**replyId**> Echo Reply number <**IP Address**> IP Address of the remote host <**replyTime**> Time,in units of 100 ms, required to receive the response <**ttl**> Time to live
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● Before sending PING Request the PDP context must be activated. ● When the Echo Request timeout expires (no reply received on time), the response will contains <**replyTime**> setting to 100(default timeout)

10 AT Commands for Network Command – LwM2M

10.1 Overview of AT Commands for Network Command – LwM2M

Command	Description
AT+CLMCONF	Configure LwM2M instance and create the connection
AT+CLMADDOBJ	Add LwM2M object
AT+CLMDELOBJ	Delete LwM2M object
AT+CLMREAD	Read notification and command
AT+CLMWRITE	Write notification and command
AT+CLMEXECUTE	Execute notification and command
AT+CLMNOTIFY	Notify data change
AT+CLMDEL	Delete LwM2M instance
+CLMOBSERVE	Indicated an observe command
+CLMPARAMETER	Indicated an observer's parameter
+CLMERR	Indicated there are some errors

10.2 Detailed Descriptions of AT Commands for Network Command – LwM2M

10.2.1 AT+CLMCONF Configure LwM2M Instance and Create the Connection

AT+CLMCONF	Configure LwM2M Instance and Create the Connection
Write Command **AT+CLMCONF=<ip_addr>,<port>,<local_port>,<name>,<domain>,<lifetime>[,<pskid><psk>]**	Response **+CLMCONF: <lwm2m_id>** **OK**
	Parameters <**ip_addr**> String, LwM2M server IP address. <**port**> Integer, LwM2M server port. <**local_port**> Integer, local port. <**name**> String,Username for show in server. <**domain**> String, specifies the type of packet data protocol: IPv4 Internet Protocol (IETF STD 5) IPv6 Internet Protocol, version 6 (IETF RFC 2460). <**lifetime**> Integer, lifetime to register LwM2M server.The unit is second. <**pskid**> String, Mandatory for DTLS register. <**psk**> String, Mandatory for DTLS register.

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

10.2.2 AT+CLMADDOBJ Add LwM2M Object

AT+CLMADDOBJ Add LwM2M Object	
Write Command **AT+CLMADDOBJ=<lwm2m_id>,<object_id>,<instance_id>,<resource_count>,<resource_id>,<resource_id>,…**	Response **OK**
	Parameters **<lwm2m_id>** Integer, LwM2M id, AT+CLMCONF's response.Range is 0-32. **<object_id>** Integer, object id.range is 0-65535. **<instance_id>** Integer, instance id. Range is 0-32. <**resource_count**> Integer, resource count. Range is 0-32. <**resource_id**> Integer, resource id. Range is 0-32.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CLMCONF should be set before this command.

10.2.3 AT+CLMDELOBJ Delete LwM2M Object

AT+CLMDELOBJ Delete LwM2M Object	
Write Command **AT+CLMDELOBJ=<lwm2m_id>,<object_id>**	Response **OK**
	Parameters **<lwm2m_id>** Integer, LwM2M id, AT+CLMCONF's response. **<object_id>** Integer, object id.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CLMADDOBJ should be set before this command.

10.2.4 AT+CLMREAD Read Notification and Command

AT+CLMREAD	Read Notification and Command
Write Command **AT+CLMREAD=<lwm2m_id>,<object_id>,<instance_id>,<resource_cnt>,<resource_id>,<value_type>,<len>,<value>,<resource_id>,<value_type>,<len>,<value>,<resource_id>,<value_type>,<len>,<value>,…**	Response This command used to indicated there is received a read operation. And then using this command to send the read operation result. **OK** **+CLMREAD:** **<lwm2m_id>,<object_id>,<instance_id>,<count>,<resource_id>,<resource_id>,<resource_id>**
	Parameters **<lwm2m_id>** Integer, LwM2M id, AT+CLMCONF's response. **<object_id>** Integer, object id. **<instance_id>** Integer, instance id. **<resource_cnt>** Integer, if it is 0, means all readable resources of the instance. **<resource_id>** Integer, if count is 0, the resource id is not exsit. **<value_type>** Char, value type. I Integer F Float B Boolean D UINT8 array data S String **<len>** Integer, value length. **<value>** Value type, value context.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

10.2.5 AT+CLMWRITE Write Notification and Command

AT+CLMWRITE	Write Notification and Command
Write Command **AT+CLMWRITE=<lwm2m_id>,<result>**	Response This command used to indicated there is received a write operation. And then using this command to send the write operation result. **OK** **+CLMWRITE:** **<lwm2m_id>,<object_id>,<instance_id>,<resource_cnt>,<resource_id>**

	,<value_type>,<len>,<value>,<resource_id>,<value_type>,<len>,<value>,<resource_id>,<value_type>,<len>,<value>,...
	Parameters **<lwm2m_id>** Integer, LwM2M id, AT+CLMCONF's response. <**result**> Integer, write result, result of write command, error code. 0 Success Other value is error code in Spec. **<object_id>** Integer, object id. **<instance_id>** Integer, instance id. <**resource cnt**> Integer, if resource_id==-1, there will be set count. <**resource_id**> Integer, resource id. -1 All of resource about the instance. <**value_type**> Char, value type. I Integer F Float B Boolean D UINT8 array data S String <**len**> Integer, value length. <**value**> Value type, value context.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

10.2.6 AT+CLMEXECUTE Execute Notification and Command

AT+CLMEXECUTE Execute Notification and Command	
Write Command **AT+CLMEXECUTE=<lwm2m_id>,<result>**	Response This command used to indicated there is received a execute operation. And then using this command to send the execute operation result. **OK** **+CLMEXECUTE: <lwm2m_id>,<object_id>,<instance_id>,<resource_id>,<len>,<buffer>**
	Parameters **<lwm2m_id>** Integer, LwM2M id, AT+CLMCONF's response. <**result**> Integer, result of write command, error code. 0 Success Other value is error code in Spec. **<object_id>** Integer, object id.

	<instance_id> Integer, instance id. <**resource_id**> Integer, resource id. -1 All of resource about the instance. <**len**> Integer, data size. <**buffer**> Raw data in hex value but char format, execute command.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

10.2.7 AT+CLMNOTIFY Notify Data Change

AT+CLMNOTIFY Notify Data Change	
Write Command **AT+CLMNOTIFY=<lwm2m_id>,<object_id>,<instance_id>,<resource_id>**	Response **OK**
	Parameters <**lwm2m_id**> Integer, LwM2M id, AT+CLMCONF's response <**object_id**> Integer, object id <**instance_id**> Integer, instance id <**resource_id**> Integer, resource id
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

10.2.8 AT+CLMDEL Delete LwM2M Instance

AT+CLMDEL Delete LwM2M Instance	
Write Command **AT+CLMDEL=<lwm2m_id>**	Response **OK**
	Parameters <**lwm2m_id**> Integer, LwM2M id, AT+CLMCONF's response
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CLMCONF should be set before this command.

10.2.9 +CLMOBSERVE Indicated an observe command

+CLMOBSERVE Indicated an observe command	
	Response This command used to indicated there is received an observe command. **+CLMOBSERVE:** **<lwm2m_id>,<code>,<object_id>[,<instance_id>],<resource_id>**
	Parameters **<lwm2m_id>** Integer, LwM2M id, AT+CLMCONF's response. <**code**> Integer, 0 Add observe 1 Cancel observe **<object_id>** Integer, object id. **<instance_id>** Integer, instance id. -1 All of instances of the object. <**resource_id**> Integer, resource id. -1 All of resource about the instance.

10.2.10 +CLMPARAMETER Indicated an observer's parameter

+CLMPARAMETER Indicated an observer's parameter	
	Response This command used to indicated there is received an observer's parameter command. **+CLMPARAMETER:** **<lwm2m_id>,<object_id>,<instance_id>,<resource_id>,<toSet>,<toClear>,<minPeriod>,<maxPeriod>,<greaterThan>,<lessThan>,<step>**
	Parameters <**lwm2m_id**> AT+CLMCONF result <**object_id**> Object id <**instance_id**> Instance id -1 All of instances and resources <**resource_id**> Resource id -1 All of resource about the instance <**toSet**> Integer, toSet value <**toClear**> Integer, toClear value <**minPeriod**> Integer, min Period <**maxPeriod**> Integer, max Period <**greaterThan**> Float,greater than <**lessThan**> Float,less than <**step**> Float,step

10.2.11 +CLMERR Indicated there are Some Errors

+CLMERR Indicated there are Some Errors	
	Response This command Indicated there are some errors. **+CLMERR: <lwm2m_id>,<error_code>**
	Parameters <**lwm2m_id**> Integer, LwM2M id, AT+CLMCONF's response. <**error_code**> Integer, error code. 1 Reset by peer point 2 Network disconnect

11 AT Commands for Network Command – MQTT

11.1 Overview of AT Commands for Network Command-MQTT

Command	Description
AT+CMQNEW	New MQTT
AT+CMQCON	Send MQTT Connection Packet
AT+CMQDISCON	Disconnect MQTT
AT+CMQSUB	Send MQTT Subscribe Packet
AT+CMQUNSUB	Send MQTT Unsubscribe Packet
AT+CMQPUB	Send MQTT Publish Packet
+CMQDISCON	MQTT Disconnect Indication
AT+CMQALICFG	Configure Alibaba Clound Parameters
AT+CMQALICON	Send MQTT Connection Packet to Alibaba Cloud
AT+CMQTTSNEW	New MQTTS
AT+CMQTTSNEWEXT	New a MQTTS Instance by Multi Packages for a Long Size Command

11.2 Detailed Descriptions of AT Commands for Network Command-MQTT

11.2.1 AT+CMQNEW New MQTT

AT+CMQNEW	**New MQTT**
Test Command **AT+CMQNEW=?**	Response **+CMQNEW: "server","port",**(list of supported **<command_timeout_ms>**s**),**(list of supported **<bufsize>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CMQNEW?**	Response **+CMQNEW: <mqtt_id>,<used_state>,<server>** **OK**
	Parameters See Write Command
Write Command **AT+CMQNEW=**	Response **+CMQNEW: <mqtt_id>**

<server>,<port>,<command_timeout_ms>,<bufsize>[,<cid>]	**OK**
	Parameters <**mqtt_id**> Integer, MQTT id, from 0 to 4 <**used_state**> The used result of mqtt_id 0 Not used 1 Used <**server**> String, null or server IP address(or MQTT server name). Max length is 50. <**port**> String, MQTT server port, can be from 0 to 65535. <**command_timeout_ms**> Integer, AT command timeout (ms), can be from 0 to 60000. <**bufsize**> Integer, buffer size,can be from 20 to 1132. <**cid**> Integer, PDP context ID, AT+CGACT response. [option]
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

11.2.2 AT+CMQCON Send MQTT Connection Packet

AT+CMQCON Send MQTT Connection Packet	
Test Command **AT+CMQCON=?**	Response **+CMQCON: <mqtt_id>,<version>,<client_id>,<keepalive_interval>,<cleansession>,<will_flag>** **OK**
	Parameters See Write Command
Read Command **AT+CMQCON?**	Response **+CMQCON: <mqtt_id>,<connected_state>,<server>** **OK**
	Parameters See Write Command
Write Command **AT+CMQCON=<mqtt_id>,<version>,<client_id>,<keepalive_inter**	Response **OK**
	Parameters <**mqtt_id**> Integer, MQTT id, AT+CMQNEW's response,from 0 to 4 <**connected_state**> The conneted result of mqtt_id,

val>,<cleansession>,<will_flag>[,<will_options>][,<username>,<password>]	0 Not connected 1 Connected <**server**> String, null(not connect) or MQTT server IP address <**version**> Integer, MQTT version. 3 MQTT 3.1 4 MQTT 3.1.1 <**client_id**> String, client ID, should be unique.Max length is 120. <**keepalive_interval**> Integer, keep alive interval, don't suggest to set it to a small value because server may disconnect the device for some reason, can be from 0 to 64800. Unit is second. <**cleansession**> Integer, clean session, can be 0 or 1. <**will_flag**> Integer, will flag, can be 0 or 1. <**will_options**> String, will options, mandatory if <will_flag> is 1, the format is as follows: topic=xxx,QoS=xxx,retained=xxx,message_len=xxx,message=xxx <**username**> String, user name (option). Max length is 100 <**password**> String, password (option). Max length is 100
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CMQNEW should be set before this command. ● If <will_flag> is 0, then we don't need input <will_options>.

11.2.3 AT+CMQDISCON Disconnect MQTT

AT+CMQDISCON Disconnect MQTT	
Test Command **AT+CMQDISCON=?**	Response **+CMQDISCON: <mqtt_id>** **OK**
	Parameters See Write Command
Write Command **AT+CMQDISCON=<mqtt_id>**	Response **OK**
	Parameters <**mqtt_id**> Integer type, MQTT id, AT+CMQNEW's response.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

	● AT+CMQCON should be set before this command.

11.2.4 AT+CMQSUB Send MQTT Subscribe Packet

AT+CMQSUB Send MQTT Subscribe Packet	
Test Command **AT+CMQSUB=?**	Response **+CMQSUB: <mqtt_id>,<topic>,<QoS>** **OK**
	Parameters See Write Command
Write Command **AT+CMQSUB=<mqtt_id>,<topic>,<QoS>**	Response **OK**
	Parameters <**mqtt_id**> Integer, MQTT id, AT+CMQNEW's response. <**topic**> String, topic of subscribe message. Max length is 128. <**Qos**> Integer, message QoS, can be 0, 1 or 2.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

11.2.5 AT+CMQUNSUB Send MQTT Unsubscribe Packet

AT+CMQUNSUB Send MQTT Unsubscribe Packet	
Test Command **AT+CMQUNSUB=?**	Response **+CMQUNSUB: <mqtt_id>,<topic>** **OK**
	Parameters See Write Command
Write Command **AT+CMQUNSUB=<mqtt_id>,<topic>**	Response **OK**
	Parameters <**mqtt_id**> Integer, MQTT id, AT+CMQNEW's response. <**topic**> String, topic of subscribe message. Max length is 128
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	Note

11.2.6 AT+CMQPUB Send MQTT Publish Packet

AT+CMQPUB Send MQTT Publish Packet	
Test Command **AT+CMQPUB=?**	Response **+CMQPUB:** **<mqtt_id>,<topic>,<QoS>,<retained>,<dup>,<message_len>,<message>** **OK**
	Parameters See Write Command
Write Command **AT+CMQPUB=<mqtt_id>,<topic>,<QoS>,<retained>,<dup>,<message_len>,<message>**	Response **OK** Unsolicited result code: If the topic has been subscribed,then return: **+CMQPUB:** **<mqtt_id>,<topic>,<QoS>,<retained>,<dup>,<message_len>,<message>**
	Parameters <**mqtt_id**> Integer, MQTT id, AT+CMQNEW's response. <**topic**> String, topic of publish message. Max length is 128 <**Qos**> Integer, message QoS, can be 0, 1 or 2. <**retained**> Integer, retained flag, can be 0 or 1. <**dup**> Integer, duplicate flag, can be 0 or 1. <**message_len**> Integer, length of publish message,can be from 2 to 1000.If message is HEX data streaming,then <message_len> should be even. <**message**> Default should be a hex data streaming,but if we set AT+CREVHEX=0 then we can send a RAW data message. And if we want to send a HEX data streaming again, we can set AT+CREVHEX=1.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note
Reference	Note

11.2.7 +CMQDISCON MQTT Disconnect Indication

+CMQDISCON	MQTT Disconnect Indication
	Response When the URC send, there is some error happen on the mqtt connection. This is probably because the MQTT server has disconnected the device for some reasons. **+CMQDISCON: <mqtt_id>**
	Parameters **<mqtt_id>** Integer, MQTT id, AT+CMQNEW's response.

11.2.8 AT+CMQALICFG Configure Alibaba Clound Parameters

AT+CMQALICFG Configure Alibaba Clound Parameters	
Test Command **AT+CMQALICFG=?**	Response **+CMQALICFG: <mqtt_id>,<productKey>,<deviceName>,<deviceSecret>** **OK**
	Parameters See Write Command
Write Command **AT+CMQALICFG=<mqtt_id>,<productKey>,<deviceName>,<deviceSecret>**	Response **OK**
	Parameters <**mqtt_id**> Integer, MQTT id, AT+CMQNEW's response,from 0 to 4 <**productKey**> Product Key,get it from Alibaba Cloud. Length from 1 to 20. <**deviceName**> Device Name,get it from Alibaba Cloud. Length from 1 to 32. <**deviceSecret**> Device Secret,get it from Alibaba Cloud. Length from 1 to 40.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CMQNEW should be set before this command. ● This command is a special command to connect to Alibaba Cloud

11.2.9 AT+CMQALICON Send MQTT Connection Packet to Alibaba Cloud

AT+CMQALICON Send MQTT Connection Packet to Alibaba Cloud	
Test Command	Response

AT+CMQALICON=?	**+CMQALICON: <mqtt_id>,<keepalive_interval>,<cleansession>** **OK**
	Parameters See Write Command
Write Command **AT+CMQALICON=<mqtt_id>,<keepalive_interval>,<cleansession>**	Response **OK**
	Parameters <**mqtt_id**> Integer, MQTT id, AT+CMQNEW's response,from 0 to 4 <**keepalive_interval**> Integer, keep alive interval, don't suggest to set it to a small value because server may disconnect the device for some reason, can be from 0 to 64800. <**cleansession**> Integer, clean session, can be 0 or 1
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CMQNEW and AT+CMQALICFG should be set before this command. ● This command is a special command to connect to Alibaba Cloud.

11.2.10 AT+CMQTTSNEW New MQTTS

AT+CMQTTSNEW New MQTTS	
Test Command **AT+CMQTTSNEW=?**	Response **+CMQTTSNEW: "server","port",**(list of supported **<command_timeout_ms>**s**),**(list of supported **<bufsize>**s**)** **OK**
	Parameters See Write Command
Read Command **AT+CMQTTSNEW?**	Response **+CMQTTSNEW: <mqtt_id>,<used_state>,<server>** **OK**
	Parameters See Write Command
Write Command **AT+CMQTTSNEW=<server>,<port>,<command_**	Response **+CMQTTSNEW: <mqtt_id>** **OK**

timeout_ms>,<bufsize>	Parameters <**mqtt_id**> Integer, MQTT id, from 0 to 4 <**used_state**> The used result of mqtt_id 0 Not used 1 Used <**server**> String, null or server IP address(or MQTT server name). Max length is 50. <**port**> String, MQTT server port, can be from 0 to 65535. <**command_timeout_ms**> Integer, AT command timeout (ms), can be from 0 to 60000. <**bufsize**> Integer, buffer size,can be from 20 to 1132.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note ● AT+CSETCA should be set before this command,we need to set the certificates first!

11.2.11 AT+CMQTTSNEWEXT NEW a MQTTS Instance by Multi Packages for a Long Size Command

AT+CMQTTSNEWEXT New a MQTTS Instance by Multi Packages for a Long Size Command	
Read Command **AT+CMQTTSNEWEXT?**	Response **+CMQTTSNEWEXT: <mqtt_id>,<used_state>,<server>** **OK**
	Parameters See Write Command
Write Command **AT+CMQTTSNEWEXT=<flag>,<total_len>,<len>,<server>,<port>,<command_timeout_ms>,<bufsize>,<server_cert_len>,<server_cert>,<client_cert_len>,<client_cert>,<client_pk_len>,<client_pk>**	Response **+CMQTTSNEWEXT: <mqtt_id>** **OK** or **ERROR**
	Parameters **<flag>** 1 Means there are more packages 0 Means this package is the last one **<total_len>** The total length of the command **<len>** The length of current package <**server**> String, null or server IP address(or MQTT server name). Max

	length is 50. <**port**> String, MQTT server port, can be from 0 to 65535. <**command_timeout_ms**> Integer, AT command timeout (ms), can be from 0 to 60000. <**bufsize**> Integer, buffer size,can be from 20 to 1132. **<server_cert_len>** Server certification length, for mqtts. <**server_cert**> Server certification, for mqtts, should be HEX format. **<client_cert_len>** Client certification length, for mqtts. <**client_cert**> Client certification, for mqtts, should be HEX format. **<client_pk_len>** Client private key length, for mqtts. <**client_pk**> Client private key, for mqtts, should be HEX format. <**mqtt_id**> Integer, MQTT id, from 0 to 4. <**used_state**> The used result of mqtt_id 0 Not used 1 Used
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

12 AT Commands for Network Command – CoAP

12.1 Overview of AT Commands for Network Command-CoAP

Command	Description
AT+CCOAPNEW	Create a CoAP client instance
AT+CCOAPSEND	Send CoAP data
AT+CCOAPCSEND	Send CoAP Data
AT+CCOAPDEL	Destory the CoAP client instance
+CCOAPNMI	Content from CoAP server

12.2 Detailed Descriptions of AT Commands for Network Command-CoAP

12.2.1 AT+CCOAPNEW Create a CoAP Client Instance

AT+CCOAPNEW Create a CoAP Client Instance	
Test Command **AT+CCOAPNEW=?**	Response **+CCOAPNEW: (0-255).(0-255).(0-255).(0-255),(0-65535),(0-10)** **OK**
	Parameters See Write Command
Write Command **AT+CCOAPNEW=<ip_addr>,<port>,<cid>**	Response **+CCOAPNEW: <coap_id>** **OK**
	Parameters <**ip_addr**> String, CoAP server IP address. <**port**> Integer, CoAP server port(spec default 5683). <**cid**> Integer, PDP context ID, AT+CGACT response. <**coap_id**> Integer, CoAP client instance id created by the command.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

12.2.2 AT+CCOAPSEND Send CoAP Data

AT+CCOAPSEND Send CoAP Data	
Test Command **AT+CCOAPSEND=?**	Response **+CCOAPSEND: (1-2),(4-512),"data"** **OK**
	Parameters See Write Command
Write Command **AT+CCOAPSEND=<coap_id>,<data_len>,<data>**	Response **OK**
	Parameters <**coap_id**> Integer, CoAP client instance id created by the AT+CCOAPNEW command. <**data_len**> Integer, Send data length (by byte). <**data**> String, the hex data streaming.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note AT+CCOAPNEW should be set before this command.

12.2.3 AT+CCOAPCSEND Send CoAP Data

AT+CCOAPCSEND Send CoAP Data	
Test Command **AT+CCOAPCSEND=?**	Response **+CCOAPCSEND:** **(1-2),(1),(0-3),(0-7),(0-31),"token","option",(0-512),"data"** **OK**
	Parameters See Write Command
Write Command **AT+CCOAPCSEND=<coap_id>,<version>,<type>,<h_code>,<l_code>,<token>,<option>,<data_len>,<data>**	Response **OK**
	Parameters <**coap_id**> Integer, CoAP client instance id created by the AT+CCOAPNEW command. <**version**> Integer, version information, the current value is 1. <**type**> Integer, the message type. 0 CON, confirmable message (requires ACK/RST). 1 NON, non-confirmable message (one-shot message). 2 ACK, used to acknowledge confirmable messages.

	3 RST, indicates error in received messages. <**h_code**> Integer, the first three bits of the <code> value. 0 Empty message or request 1 Reserved 2-5 Response 6-7 Reserved **<l_code>** Integer, the last five bits of the <code> value (0-31). <code> Function code or response code. Code takes different forms in CoAP request message and response message. Code takes one byte and is divided into two parts, the first three bits <h_code> and the last five bits <l_code> In order to describe it conveniently, it is written into c.dd structure(such as 0.01,2.01,4.02 and so on). For example, if <h_code> is 4 and <l_code> is 12, so <code> is 4.12. **Request:** [0.01]GET method,get resource [0.02]POST method,creat resource [0.03]PUT method,update resource [0.04]DELETE method,delete resource **Response:** [2.01]Created [2.02]Deleted [2.03]Valid [2.04]Changed [2.05]Content. [4.00]Bad Request. [4.01]Unauthorized. [4.02]Bad Option. [4.03]Forbidden. [4.04]Not Found. [4.05]Method Not Allowed. [4.06]Not Acceptable. [4.12]Precondition Failed. [4.15]Unsuppor Conten-Type. [5.00]Internal Server Error. [5.01]Not Implemented. [5.02]Bad Gateway. [5.03]Service Unavailable. [5.04]Gateway Timeout. [5.05]Proxying Not Supported. <**token**> String, the hex data streaming,request id,relate the response to the request (option). <**option**> String, the hex data streaming,zero or more options (option).

	<**data_len**> Integer, Send data length (by byte). <**data**> String, the hex data streaming (payload).
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note AT+CCOAPNEW should be set before this command.

12.2.4 AT+CCOAPDEL Destory the CoAP Client Instance

AT+CCOAPDEL Destory the CoAP Client Instance	
Test Command **AT+CCOAPDEL=?**	Response **+CCOAPDEL: (1-2)** **OK**
	Parameters See Write Command
Write Command **AT+CCOAPDEL=<coap_id>**	Response **OK**
	Parameters <**coap_id**> Integer, CoAP client instance id created by the AT+CCOAPNEW command.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note AT+CCOAPNEW should be set before this command.

12.2.5 +CCOAPNMI Content from CoAP server

+CCOAPNMI Content from CoAP server	
	Response **+CCOAPNMI: <coap_id>,<data_len>,<data>**
	Parameters <**coap_id**> Integer, CoAP client instance id created by the AT+CCOAPNEW command. <**data_len**> Integer, data length (by byte). <**data**> String, the hex data streaming.

13 AT Commands for Network Command – SNTP

13.1 Overview of AT Commands for Network Command-SNTP

Command	Description
AT+CSNTPSTART	Start to query network time
AT+CSNTPSTOP	Stop to query network time
+CSNTP	Received network time

13.2 Detailed Descriptions of AT Commands for Network Command-SNTP

13.2.1 AT+CSNTPSTART Start to Query Network Time

AT+CSNTPSTART Start to Query Network Time	
Write Command **AT+CSNTPSTART=<url>[,zone]**	Response **OK**
	Parameters <**url**> A string of SNTP server name or IP address. <**zone**> String type value; On behalf of the time zone, range -47...+48.The eastern region is denoted as "+32".
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

13.2.2 AT+CSNTPSTOP Stop to Query Network Time

AT+CSNTPSTOP Stop to Query Network Time	
Execution Command **AT+CSNTPSTOP**	Response **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

13.2.3 +CSNTP Received Network Time

+CSNTP Received Network Time	
	Response Indicated there is received some data from network. **+CSNTP: <time>[,zone]**
	Parameters <**time**> String type value; format is yy/MM/dd,hh:mm:ss:ms, where characters indicate year (two last digits),month, day, hour, minutes, seconds and millisecond . E.g 10/05/06,00:01:52:62 <**zone**> String type value; On behalf of the time zone, range -47...+48.The eastern region is denoted as "+32".

14 AT Commands for Network Command – TLS

14.1 Overview of AT Commands for Network Command- TLS

Command	Description
AT+CTLSCFG	Configure TLS parameters
AT+CTLSCONN	Create a TLS connection
AT+CTLSCLOSE	Close a TLS connection
AT+CTLSSEND	Send data
AT+CTLSRECV	Receive data
AT+CSETCA	Set the Certificate Parameters

14.2 Detailed Descriptions of AT Commands for Network Command-TLS

14.2.1 AT+CTLSCFG Configure TLS Parameters

AT+CTLSCFG	Configure TLS Parameters
Write Command **AT+CTLSCFG=<tid>,<type>,<value>[,<type>,<value>[,<type>,<value>[…]]]**	Response **OK**
	Parameters <**tid**> Integer type.It is the identifier of the TLS connection to be created. The values(1-6). <**type**> Integer type.It is the type of the parameter to be configured. 1 Server name (string) 2 Port (int, default value is 443) 3 Socket type (0-tcp, tcp supported only, default value is 0) 4 Auth_mode (int, 0-none, 1-optional, 2-required, default value is 2) 5 Debug level (int, 0~4, 0-no log, 4-all log enabled, default value is 0) 6 Server CA (<size><more><certificate>, size (int)-total size of the certificate without the terminate null; more(int)-is there more certificate content needed to be sent, 1-yes, 0-no; certificate (string)-the total or particial of the certificate content. default value for type 6 is null) 7 Client certificate (same as 6-server CA, default value for type 7 is null) 8 Client private key (<size><more><private-key>, size and more is the same as 6-server CA, private-key (string)-the total or partical of the private-key, default value for type 8 is null) <**value**> Integer type.It is the value of the parameter to be configured.

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

14.2.2 AT+CTLSCONN Create a TLS Connection

AT+CTLSCONN Create a TLS Connection	
Write Command **AT+CTLSCONN=<tid>,<cid>**	Response **OK** **+CTLSCONN: <tid>,<ret>**
	Parameters <**tid**> Integer type. It is the identifier of the TLS connection to be created.It shoud be the same as the one in CTLSCFG. <**ret**> Integer type.It tells the result of the TLS connection.If the connection succeeds, it is 1.Otherwise,it is the error code. See 20.4 Summary of TLS ERROR Codes for details.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

14.2.3 AT+CTLSCLOSE Close a TLS Connection

AT+CTLSCLOSE Close a TLS Connection	
Write Command **AT+CTLSCLOSE=<tid>**	Response **OK** **+CTLSCLOSE: <tid>,<ret>**
	Parameters <**tid**> Integer type.It is the identifier of the TLS connection to be created.It shoud be the same as the one in CTLSCFG. <**cid**> Integer type.It is a numeric parameter specifying a particular PDP context returned by CGACT. <**ret**> Integer type.It tells the result of the TLS connection closure.If the closure succeeds, it is 1.Otherwise, it is the error code. See 20.4 Summary of TLS ERROR Codes for details.
Parameter Saving	NO_SAVE

Mode	
Max Response Time	-
Reference	Note

14.2.4 AT+CTLSSEND Send Data

AT+CTLSSEND	**Send Data**
Write Command **AT+CTLSSEND=<tid>,<data_len>,<data>[,<encod_method>]**	Response **OK** **+CTLSSEND: <tid>,<ret>**
	Parameters <**tid**> Integer type.It is the identifier of the TLS connection to be created.It shoud be the same as the one in CTLSCFG. <**data_len**> Integer type.It is the length of the <data>. Maximum length of a single transmission 1024. <**data**> It is the data sent. <**encod_method**> Integer type.It is the encode method used for <data>. 801 String encoding and it is the default value which can be omitted. 802 Hex encoding 803 Base64 encoding <**ret**> Integer type.It tells the result of the data sending.If it is greater than 0, it is the actual number of data send.Otherwise, it is the error code. See 20.4 Summary of TLS ERROR Codes for details.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

14.2.5 AT+CTLSRECV Receive Data

AT+CTLSRECV	**Receive Data**
Write Command **AT+CTLSRECV=<tid>,<max_num>[,<encod_method>]**	Response **OK** **+CTLSRECV: <tid>,<ret>[,<data>[,<encode_method>]]**
	Parameters <**tid**> Integer type. It is the identifier of the TLS connection to be created.It shoud be the same as the one in CTLSCFG.

	<**max_num**> Integer type. It is the maximum number of plain data without encoding that could be received. When encod_method=801,the maximum receiving length of a single time is 1024, Otherwise the maximum receiving length of a single time is 512. <**encod_method**> Integer type. It is the encode method used for <data>. 801 String encoding and it is the default value which can be omitted. 802 Hex encoding. 803 Base64 encoding. <**ret**> Integer type.If it is greater than 0, it is the length of data received after encoding .Otherwise, it is the error code. See 20.4 Summary of TLS ERROR Codes for details. <**data**> It is the data received with encoding.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

14.2.6 AT+CSETCA Set the Certificate Parameters

AT+CSETCA Set the Certificate Parameters	
Read Command **AT+CSETCA?**	Response **<type>: <total_len>** **OK**
	Parameters See Write Command
Write Command **AT+CSETCA=<type>,<total_len>,<is_end>,<encod_method>,<ca_data>**	Response **OK**
	Parameters <**type**> String type. 0 Root CA,root certificate. 1 Client CA,client certificate. 2 Client Private Key. 3 PSKID 4 PSK <**total_len**> Integer type.The total length of the certificate. <**is_end**> Is there more certificate content needed to be sent. 0 No 1 Yes <**encod_method**> Integer type.It is the encode method used for <ca_data>. 0 String encoding

	1 Hex encoding <**ca_data**> String type.Content of the certificate.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

15 AT Commands for Network Command –OneNet

15.1 Overview of AT Commands for Network Command- OneNet

Command	Description
AT+MIPLCREATE	Create a OneNet instance
AT+MIPLCREATEEXT	Another method to Create a OneNet instance
AT+MIPLDELETE	Delete a OneNet instance
AT+MIPLOPEN	Register to OneNet.
AT+MIPLCLOSE	Deregister to OneNet
AT+MIPLADDOBJ	Add an object
AT+MIPLDELOBJ	Delete an object
AT+MIPLUPDATE	Update registration
AT+MIPLREADRSP	Read response from user
AT+MIPLWRITERSP	Write response from user
AT+MIPLEXECUTERSP	Execute response from user
AT+MIPLOBSERVERSP	Observe response from user
AT+MIPLDISCOVERRSP	Discover response from user
AT+MIPLPARAMETERRSP	Set parameter from user
AT+MIPLNOTIFY	Notify data value change from user
AT+MIPLVER	Read version
+MIPLREAD	Read request to user
+MIPLWRITE	Write request to user
+MIPLEXECUTE	Execute request to user
+MIPLOBSERVE	Observe request to user
+MIPLDISCOVER	Discover request to user
+MIPLPARAMETER	Set parameter request to user
+MIPLEVENT	Event indication to user

15.2 Detailed Descriptions of AT Commands for Network Command-OneNet

15.2.1 AT+MIPLCREATE Create a OneNet Instance

AT+MIPLCREATE Create a OneNet Instance	
Test Command **AT+MIPLCREATE=?**	Response **+MIPLCREATE:** (list of supported <**totalsize**>),(list of supported <**config**>),(list of supported <**index**>),(list of supported <**currentsize**>),(list of supported <**flag**>) **OK**
	Parameters See Write Command
Read Command **AT+MIPLCREATE?**	Response **+MIPLCREATE: <id>,<used_state>** **OK**
	Parameters See Write Command
Write Command **AT+MIPLCREATE=<totalsize>,<config>,<index>,<currentsize>,<flag>**	Response **OK** --message received correctly if index not equals to 0 **+MIPLCREATE: <id>** **OK** --message received correctly and return OneNet instance or **+CIS ERROR: <err>**
	Parameters <**totalsize**> Integer, configuration file total size(it is byte size) <**config**> Hex string, configuration file, ex: 130033f1…… <**index**> Integer, configuration file index, from 0 to 1024 <**currentsize**> Integer, configuration file size in current AT command(it is byte size) <**flag**> Integer, message flag 1 First message 2 Middle message 0 Last message <**id**> Integer, create onenet id **<used_state>** Integer, the used result of AT+MIPLCREATE 0 Not used

	1 Used
Execution Command **AT+MIPLCREATE**	Response **+MIPLCREATE: <id>** **OK** or **+CIS ERROR: <err>** Create OneNet default config as host of "183.230.40.39" with bootstrap.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.2 AT+MIPLCREATEEXT Another Method to Create a OneNet Instance

AT+MIPLCREATEEXT Another Method to Create a OneNet Instance	
Test Command **AT+MIPLCREATEEXT=?**	Response **+MIPLCREATEEXT: (0-255).(0-255).(0-255).(0-255),(0,1)** **OK**
	Parameters See Write Command
Read Command **AT+MIPLCREATEEXT?**	Response **+MIPLCREATEEXT: <id>,<used_state>** **OK**
	Parameters See Write Command
Write Command **AT+MIPLCREATEEXT=<addr>,<bs>**	Response **+MIPLCREATEEXT: <id>** **OK** --message received correctly and return OneNet instance or **+CIS ERROR: <err>**
	Parameters <**addr**> String. OneNet host IP address <**bs**> Integer. OneNet host bootstrap value 0 Bootstrap disabled 1 Bootstrap enabled Such as: 183.230.40.39, bs value is set to 1 183.230.40.40, bs value is set to 0

	<**id**> Integer, Create onenet id <**used_state**> Integer.The used result of AT+MIPLCREATE 0 Not used 1 Used
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note The parameter of "BS" is necessary from OneNet Ver 2.2.0, but it is needless before OneNet Ver2.2.0.

15.2.3 AT+MIPLDELETE Delete a OneNet Instance

AT+MIPLDELETE Delete a OneNet Instance	
Test Command **AT+MIPLDELETE=?**	Response **+MIPLDELETE:** (list of supported **<id>)** **OK**
	Parameters See Write Command
Write Command **AT+MIPLDELETE=<id>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.4 AT+MIPLOPEN Register to OneNet

AT+MIPLOPEN Register to OneNet	
Test Command **AT+MIPLOPEN=?**	Response **+MIPLOPEN:** (list of supported <**id**>),(list of supported <**lifetime**>),(list of supported <**param**>) **OK**
	Parameters See Write Command

Read Command **AT+MIPLOPEN?**	Response **+MIPLOPEN: <id>,<connected_state>** **OK**
	Parameters See Write Command
Write Command **AT+MIPLOPEN=<id>,<lifetime>[,<param>]**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE <**lifetime**> Integer, lifetime to register ONENET server.The unit is second. <**param**> Reserved **<connected_state>** The connected result of AT+MIPLOPEN 0 Not connected 1 Connected
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.5 AT+MIPLCLOSE Deregister to OneNet

AT+MIPLCLOSE Deregister to OneNet	
Test Command **AT+MIPLCLOSE=?**	Response **+MIPLCLOSE:** (list of supported **<id>)** **OK**
	Parameters See Write Command
Write Command **AT+MIPLCLOSE=<id>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE
Parameter Saving Mode	NO_SAVE
Max Response	-

Time	
Reference	

15.2.6 AT+MIPLADDOBJ Add an Object

AT+MIPLADDOBJ Add an Object	
Test Command **AT+MIPLADDOBJ=?**	Response **+MIPLADDOBJ:** (list of supported **<id>),**(list of supported **<objectid>),**(list of supported **<instancecount>),**(list of supported **<instancebitmap>),**(list of supported **<attributecount>),**(list of supported **<actioncount>)** **OK**
	Parameters See Write Command
Read Command **AT+MIPLADDOBJ?**	Response **+MIPLADDOBJ: <object_num>** **OK**
	Parameters See Write Command
Write Command **AT+MIPLADDOBJ=<id>,<objectid>,<instancecount>,<instancebitmap>,<attributecount>,<actioncount>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<objectid>** Integer, object id **<instancecount>** Integer, instance count **<instancebitmap>** Binary string, instance bitmap, ex: "00101" (5 instances, only instance 1 & 3 are available) **<attributecount>** Integer, attribute count(The Object that has read or write operation, has the attribute) **<actioncount>** Integer, action count(The Object that has execute operation, has the action) **<object_num>** Current OneNet object number
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.7 AT+MIPLDELOBJ Delete an Object

AT+MIPLDELOBJ Delete an Object	
Test Command **AT+MIPLDELOBJ=?**	Response **+MIPLDELOBJ:** (list of supported **<id>),**(list of supported **<objectid>)** **OK**
	Parameters See Write Command
Write Command **AT+MIPLDELOBJ=<id>,<objectid>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<objectid>** Integer, object id
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.8 AT+MIPLUPDATE Update Registration

AT+MIPLUPDATE Update Registration	
Test Command **AT+MIPLUPDATE=?**	Response **+MIPLUPDATE:** (list of supported **<id>),**(list of supported **<lifetime>),(**list of supported **<withObjectFlag>**) **OK**
	Parameters See Write Command
Write Command **AT+MIPLUPDATE=<id>,<lifetime>,<withObjectFlag>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<lifetime>** Integer, lifetime to update registration. The unit is second. **<withObjectFlag>** Integer, whether to update objects 0 Not upate objects 1 Update objects
Parameter Saving	NO_SAVE

Mode	
Max Response Time	-
Reference	

15.2.9 AT+MIPLREADRSP Read Response from User

AT+MIPLREADRSP Read Response from User	
Test Command **AT+MIPLREADRSP=?**	Response **+MIPLREADRSP:** (list of supported **<id>),**(list of supported **<msgid>),**(list of supported **<result>),**(list of supported **<objectid>),**(list of supported **<instanceid>)**,(list of supported <**resourceid**>),(list of supported <**valuetype**>),(list of supported <**len**>),(list of supported <**value**>),(list of supported <**index**>),(list of supported <**flag**>) **OK**
	Parameters See Write Command
Write Command **AT+MIPLREADRSP=<id>,<msgid>,<result>,<objectid>,<instanceid>,<resourceid>,<valuetype>,<len>,<value>,<index>,<flag>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id,the same to +MIPLREAD <**result**> Integer, read result, 1 indicates read success, should provide read content in the same time 1 Read/Observe/Discover OK 2 Write/Execute/ Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable **<objectid>** Integer, object id **<instanceid>** Integer, instance id **<resourceid>** Integer, resource id <**valuetype**> Integer, read data value type 1 String 2 Opaque 3 Integer 4 Float 5 Bool

	<len> Integer, read data length. It can be ommited, if valuetype is Integer or Float, or Bool **<value>** Integer, read data value **<index>** Integer, message index, from 0 to 1024 **<flag>** Integer, message flag 1 First message 2 Middle message 0 Last message
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.10 AT+MIPLWRITERSP Write Response from User

AT+MIPLWRITERSP Write Response from User	
Test Command **AT+MIPLWRITERSP=?**	Response **+MIPLWRITERSP:** (list of supported **<id>),**(list of supported **<msgid>),**(list of supported **<result>)** **OK**
	Parameters See Write Command
Write Command **AT+MIPLWRITERSP=<id>,<msgid>,<result>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id, the same to +MIPLWRITE **<result>** Integer, write result, 2 indicates write success 1 Read/Observe/Discover OK 2 Write/Execute/ Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	

15.2.11 AT+MIPLEXECUTERSP Execute Response from User

AT+MIPLEXECUTERSP Execute Response from User	
Test Command **AT+MIPLEXECUTERSP=?**	Response **+MIPLEXECUTERSP:** (list of supported **<id>),**(list of supported **<msgid>),**(list of supported **<result>)** **OK**
	Parameters See Write Command
Write Command **AT+MIPLEXECUTERSP=<id><msgid>,<result>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id, the same to +MIPLEXECUTE **<result>** Integer, execute result, 2 indicates execute success 1 Read/Observe/Discover OK 2 Write/Execute/ Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.12 AT+MIPLOBSERVERSP Observe Response from User

AT+MIPLOBSERVERSP Observe Response from User	
Test Command **AT+MIPLOBSERVERSP=?**	Response **+MIPLOBSERVERSP:** (list of supported **<id>),**(list of supported **<msgid>),**(list of supported **<result>)** **OK**
	Parameters See Write Command

Write Command **AT+MIPLOBSERVERSP=<id>,<msgid>,<result>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id, the same to +MIPLOBSERVE **<result>** Integer, (cancel) observe result, 1 indicates (cancel) observe success 1 Read/Observe/Discover OK 2 Write/Execute/ Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.13 AT+MIPLDISCOVERRSP Discover Response from User

AT+MIPLDISCOVERRSP Discover Response from User	
Test Command **AT+MIPLDISCOVERRSP=?**	Response **+MIPLDISCOVERRSP:** (list of supported **<id>),**(list of supported **<msgid>),**(list of supported **<result>),**(list of supported **<length>),**(list of supported **<valuestring>)** **OK**
	Parameters See Write Command
Write Command **AT+MIPLDISCOVERRSP=<id>,<msgid>,<result><length>,<valuestring>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id, the same to +MIPLDISCOVER <**result**> Integer, discover result, 1 indicates discover success 1 Read/Observe/Discover OK 2 Write/Execute/Set parameter OK

	11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable **<length>** Integer, length of valuestring **<valuestring>** String, value string (resourceId; resourceId; …; resourceId), must start with "" and end with ""
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.14 AT+MIPLPARAMETERRSP Set Parameter from User

AT+MIPLPARAMETERRSP Set Parameter from User	
Test Command **AT+MIPLPARAMETERRSP=?**	Response **+MIPLPARAMETERRSP:** (list of supported **<id>),**(list of supported **<msgid>),**(list of supported **<result>)** **OK**
	Parameters See Write Command
Write Command **AT+MIPLPARAMETERRSP=<id>,<msgid>,<result>**	Response **OK** or **+CIS ERROR: <err>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id, the same to +MIPLPARAMETER **<result>** Integer, set parameter result, 2 indicates set parameter success 1 Read/Observe/Discover OK 2 Write/Execute/Set parameter OK 11 400 Bad request 12 401 Unauthorized 13 404 Not Found 14 405 Method Not Allowed 15 406 Not Acceptable
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	

15.2.15 AT+MIPLNOTIFY Notify Data Value Change from User

AT+MIPLNOTIFY Notify Data Value Change from User	
Test Command **AT+MIPLNOTIFY=?**	Response **+MIPLNOTIFY:** (list of supported **<id>),**(list of supported **<msgid>),**(list of supported **<objectid>),**(list of supported **<instanceid>),**(list of supported **<resourceid>),**(list of supported <**valuetype**>),(list of supported <**len**>),(list of supported <**value**>),(list of supported <**index**>),(list of supported <**flag**>),(list of supported <**ack**>) **OK**
	Parameters See Write Command
Write Command **AT+MIPLNOTIFY=<id>,<msgid>,<objectid>,<instanceid>,<resourceid>,<valuetype>,<len>,<value>,<index>,<flag>[,<ack>]**	Response **OK** or **+CIS ERROR: <err>**
	Parameters <**id**> Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id **<objectid>** Integer, object id **<instanceid>** Integer, instance id **<resourceid>** Integer, resource id <**valuetype**> Integer, read data value type 1 String 2 Opaque 3 Integer 4 Float 5 Bool **<len>** Integer, write data length. It can be ommited, if valuetype is Integer or Float, or Bool **<value>** Integer, write data value **<index>** Integer, message index, from 0 to 1024 **<flag>** Integer, message flag 1 First message 2 Middle message 0 Last message <**ack**> Integer, ack id [option] If omit it, there is no result URC after this command
Parameter Saving Mode	NO_SAVE

Max Response Time	-
Reference	

15.2.16 AT+MIPLVER Read Version

AT+MIPLVER Read Version	
Read Command **AT+MIPLVER?**	Response **+MIPLVER: <version>** **OK**
	Parameters **<version>** Onenet version, such as 2.2.0
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

15.2.17 +MIPLREAD Read Request to User

+MIPLREAD Read Request to User	
	Response **+MIPLREAD: <id>,<msgid>,<objectid>,<instanceid>,<resourceid>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id **<objectid>** Integer, object id **<instanceid>** Integer, instance id, read all resources of all instances of the object if instanceid equals -1 **<resourceid>** Integer, resource id, read all resources of the instance if resourceid equals -1

15.2.18 +MIPLWRITE Write Request to User

+MIPLWRITE Write Request to User	
	Response **+MIPLWRITE: <id>,<msgid>,<objectid>,<instanceid>,<resourceid>,<valuetype>,<len>,<value>,<flag>,<index>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id

	<objectid> Integer, object id **<instanceid>** Integer, instance id **<resourceid>** Integer, resource id **<valuetype>** Integer, write data value type 1 String 2 Opaque 3 Integer 4 Float 5 Bool **<len>** Integer, write data length. It can be ommited, if valuetype is Integer or Float, or Bool **<value>** Integer, write data value <**flag**> Integer, message flag 1 First message 2 Middle message 0 Last message <**index**> Integer, message index, from 0 to 1024

15.2.19 +MIPLEXECUTE Execute Request to User

+MIPLEXECUTE Execute Request to User	
	Response **+MIPLEXECUTE:** **<id>,<msgid>,<objectid>,<instanceid>,<resourceid>,<len>,<arguments>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id **<objectid>** Integer, object id **<instanceid>** Integer, instance id **<resourceid>** Integer, resource id **<len>** Integer, parameter length **<arguments>** String, parameter string

15.2.20 +MIPLOBSERVE Observe Request to User

+MIPLOBSERVE Observe Request to User	
	Response **+MIPLOBSERVE:** **<id>,<msgid>,<flag>,<objectid>,<instanceid>,<resourceid>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id <**flag**> Integer, observe flag.

	1 Indicates observe 0 Indicates cancel observe **<objectid>** Integer, object id **<instanceid>** Integer, instance id, observe all resources of all instances of the object if instanceid equals -1 **<resourceid>** Integer, resource id, observe all resources of the instance if resourceid equals -1

15.2.21 +MIPLDISCOVER Discover request to User

+MIPLDISCOVER Discover request to User	
	Response **+MIPLDISCOVER: <id>,<msgid>,<objectid>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id **<objectid>** Integer, object id

15.2.22 +MIPLPARAMETER Set Parameter Request to User

+MIPLPARAMETER Set Parameter Request to User	
	Response **+MIPLPARAMETER: <id>,<msgid>,<objectid>,<instanceid>,<resourceid>,<len>,<parameter>**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE **<msgid>** Integer, message id **<objectid>** Integer, object id **<instanceid>** Integer, instance id, observe all resources of all instances of the object if instanceid equals -1 **<resourceid>** Integer, resource id, observe all resources of the instance if resourceid equals -1 <**len**> Integer, parameter length <**parameter**> String, parameter string, must start with "and end with" pmin=xxx; pmax=xxx; gt=xxx; lt=xxx; stp=xxx

15.2.23 +MIPLEVENT Event Indication to User

+MIPLEVENT Event Indication to User	
	Response **+MIPLEVENT: <id>,<evtid>[,<extend>]**
	Parameters **<id>** Integer, OneNet instance returned by AT+MIPLCREATE

	<evtid> Integer, event id 1 BOOTSTRAP_START 2 BOOTSTRAP_SUCCESS 3 BOOTSTRAP_FAILED 4 CONNECT_SUCCESS 5 CONNECT_FAILED 6 REG_SUCCESS 7 REG_FAILED 8 REG_TIMEOUT 9 LIFETIME_TIMEOUT 10 STATUS_HALT 11 UPDATE_SUCCESS 12 UPDATE_FAILED 13 UPDATE_TIMEOUT 14 UPDATE_NEED 15 UNREG_DONE 20 RESPONSE_FAILED 21 RESPONSE_SUCCESS 25 NOTIFY_FAILED 26 NOTIFY_SUCCESS <**extend**> Integer, extend parameter [option] The events of RESPONSE_FAILED and NOTIFY_FAILED can take msgid The events of UPDATE_NEED can take LIFETIME(unit is second) The events of RESPONSE_SUCCESS can take ack

16 AT Commands for NVRAM

16.1 Overview of AT Commands for NVRAM Command

Command	Description
AT+CNVMR	Read data from NVRAM
AT+CNVMW	Write data to NVRAM
AT+CNVMIVD	Invalidate a specific data item in NVRAM
AT+CNVMGET	Get all Customer Data Item IDs from NVRAM

16.2 Detailed Descriptions of AT Commands for NVRAM Command

16.2.1 AT+CNVMR Read Data from NVRAM

AT+CNVMR Read Data from NVRAM	
Test Command **AT+CNVMR=?**	Response **+CNVMR: "Data item name"** **OK**
	Parameters See Write Command
Write Command **AT+CNVMR=<data_item_name>**	Response **+CNVMR:** **<read_status>[,<data_item_name>,<length>,<nvram_data>]** **OK** or **ERROR**
	Parameters **<read_status>** If the succeeds,it is 0.Otherwise,it is the error code. 0 Success -4 Means the data item wasn't found by the NVRAM. There may be other error codes. **<data_item_name>** A string parameter which indicates the nvram data item name, the string length can be from 1 to 20. **<length>** Integer,the length of the <data_item_name> item NVRAM Data. **<nvram_data>** A string parameter which indicates the nvram data.
Parameter Saving Mode	NO_SAVE

Max Response Time	-
Reference	Note

16.2.2 AT+CNVMW Write Data to NVRAM

AT+CNVMW Write Data to NVRAM	
Test Command **AT+CNVMW=?**	Response **+CNVMW: "Data item name","Data item value",(1-1024)** **OK**
	Parameters See Write Command
Write Command **AT+CNVMW=<data_item_name>,<nvram_data>,<length>**	Response **+CNVMW: <write_status>** **OK** or **ERROR**
	Parameters **<write_status>** If the succeeds, it is 0.Otherwise, it is the error code. 0 Success -7 Means no enough customers NVRAM space. There may be other error codes. **<data_item_name>** A string parameter which indicates the data item name you want to write,the string length can be from 1 to 20. **<nvram_data>** A string parameter which indicates the data you want to write in to nvram, the data length can be from 1 to 1024. **<length>** Integer,the length of the <nvram_data>,can be from 1 to 1024.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

16.2.3 AT+CNVMIVD Invalidate a Specific Data Item in NVRAM

AT+CNVMIVD Invalidate a Specific Data Item in NVRAM	
Test Command **AT+CNVMIVD=?**	Response **+CNVMIVD: "Data item name"** **OK**
	Parameters

	See Write Command
Write Command **AT+CNVMIVD=<data_item_name>**	Response **+CNVMIVD: <status>** **OK** or **ERROR**
	Parameters **<status>** If the succeeds,it is 0.Otherwise,it is the error code. 0 Success -4 Means the data item wasn't found by the NVRAM. There may be other error codes. **<data_item_name>** A string parameter which indicates the data item name you want to write, the string length can be from 1 to 20.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

16.2.4 AT+CNVMGET Get all Customer Data Item IDs from NVRAM

AT+CNVMGET	**Get all Customer Data Item IDs from NVRAM**
Execution Command **AT+CNVMGET**	Response If successful, return: **+CNVMGET: <id>,<group_name>,<data_item_name>** **OK** If no customer NVRAM data item, return: **+CNVMGET: NULL** **OK** or **ERROR**
	Parameters **<id>** The id of the data item. **<group_name>** A string parameter which indicates the group name you have wrote in to nvram. **<data_item_name>** A string parameter which indicates the data item name you have wrote in to nvram with AT+CNVMW.
Parameter Saving Mode	NO_SAVE
Max Response	-

Time	
Reference	Note

17 AT Commands for CT IOT Platform

17.1 Overview of AT Commands for CT IOT Platform

Command	Description
AT+CM2MCLINEW	Register to CT IOT Platform
AT+CM2MCLISEND	Send data to CT IOT Platform
AT+CM2MCLIDEL	Deregister to CT IOT Platform
AT+CM2MCLIGET	Get the lastest 6 received data
+CM2MCLI	CT IOT client notification
+CM2MCLIRECV	Receive data from CT IOT platform

17.2 Detailed Descriptions of AT Commands for CT IOT Platform

17.2.1 AT+CM2MCLINEW Register to CT IOT Platform

AT+CM2MCLINEW Register to CT IOT Platform	
Write Command **AT+CM2MCLINEW=<server>,<port>,<endpoint>[,<lifetime>[,<pskid>,<psk>]]**	Response **OK** **+CM2MCLI: 1** **+CM2MCLI: 4** or **ERROR**
	Parameters <**server**> String, LwM2M server IP address of CT IOT platform.. <**port**> Integer, LwM2M server port of CT IOT platform. <**endpoint**> String, Endpoint name, the format should be "xxx", xxx is the IMEI of device. <**lifetime**> Integer, The time interval to send "update registration" to CT IOT platform, Don't update by default. <**pskid**> String, Mandatory for DTLS register,use device's IMEI for CT IOT platform. <**psk**> String, Mandatory for DTLS register,supply by CT IOT platform.
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	Note

17.2.2 AT+CM2MCLISEND Send Data to CT IOT Platform

AT+CM2MCLISEND Send Data to CT IOT Platform	
Write Command **AT+CM2MCLISEND=<data>**	Response **OK** **+CM2MCLI: 5** or **ERROR**
	Parameters <**data**> String, HEX format, should be even, the supported characters are 0~9, A~F, a~f.
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

17.2.3 AT+CM2MCLIDEL Deregister to CT IOT Platform

AT+CM2MCLIDEL Deregister to CT IOT Platform	
Execute Command **AT+CM2MCLIDEL**	Response **OK** **+CM2MCLI: 3** or **ERROR**
	Parameters NONE
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

17.2.4 AT+CM2MCLIGET Get the Lastest 6 Received Data

AT+CM2MCLIGET Get the Lastest 6 Received Data	
Read Command **AT+CM2MCLI**	Response **No Data!**

GET?	**OK** or **+CM2MCLIRECV: <data>** **[[+CM2MCLIRECV: <data>]** **...]** **OK** or **ERROR**
	Parameters NONE
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Note

17.2.5 +CM2MCLI CT IOT Client Notification

+CM2MCLI CT IOT Client Notification	
	Response **+CM2MCLI: <n>**
	Parameters <**n**> Integer, Notification. 0 Response error 1 Device registered to CT IOT platform successfully 2 Device updated registration to CT IOT platform successfully 3 Device deregistered to CT IOT platform successfully 4 Device received object 19 observation successfully from CT IOT platform 5 Device sent data to CT IOT platform 6 Reserve,define later 7 Device registered to CT IOT platform failed

17.2.6 +CM2MCLIRECV Receive data from CT IOT Platform

+CM2MCLIRECV Receive data from CT IOT platform	
	Response **+CM2MCLIRECV: <data>**
	Parameters <**data**> String, HEX format, should be even, the supported characters are 0~9, A~F, a~f.

18 AT Commands for Network Command-DM

18.1 Overview of AT Commands for Network Command-DM

Command	Description
AT+DMCONFIGEXT	Config paramters for DM
AT+DMSET	Set DM state

18.2 Detailed Descriptions of AT Commands for Network Command-DM

18.2.1 AT+DMCONFIGEXT Configure paramters for DM

AT+DMCONFIGEXT Configure paramters for DM	
Test Command **AT+DMCONFIGEXT=?**	Response **+DMCONFIGEXT: (0-255).(0-255).(0-255).(0-255),(0,1),"appkey","pwd",(**list of supported **<lifetime>)** **OK**
	Parameters See Write Command
Write Command **AT+DMCONFIGEXT=<addr>,<bs>,<appkey>,<pwd>,<lifetime>**	Response **OK** or **ERROR**
	Parameters <**addr**> String, DM host IP address <**bs**> Integer,DM host bootstrap value 0 Bootstrap disabled 1 Bootstrap enabled Such as: 117.161.2.7, bs value is set to 0 <**appkey**> String, appkey for register DM **<pwd>** String, secret key for register DM **<lifetime>** Integer, lifetime for register DM
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

18.2.2 AT+DMSET Set DM State

AT+DMSET Set DM State	
Test Command **AT+DMSET=?**	Response **+DMSET: (0-1)** **OK**
	Parameters See Write Command
Read Command **AT+DMSET?**	Response **+DMSET: <value>** **OK**
	Parameters See Write Command
Write Command **AT+DMSET=<value>**	Response **OK** or **ERROR**
	Parameters <**value**> Integer, set DM on or off state 0 DM off 1 DM on
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

19 AT Commands for FOTA

19.1 Overview of AT Commands for FOTA

Command	Description
AT+CFOTA	FOTA Operation
AT+CFLE	Flash Erase
AT+CFLW	Flash Write
AT+CFLR	Flash Read

19.2 Detailed Descriptions of AT Commands for FOTA

19.2.1 AT+CFOTA FOTA Operation

AT+CFOTA FOTA Operation	
AT+CFOTA=<mode>[,version][,<len>,<md5>]	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<mode>** Operation type 1 Download and update differential package by TCP 2 Download differential package by TCP,not update 3 Update differential package after **<mode>=2** 4 Report update result to FOTA server 5 Update differential package after local download **<len>** The update differential package length **<md5>** The update differential package MD5 check value
Parameter Saving Mode	NO_SAVE
Reference	Note ● When <**mode**>=1 or 2 The PDP connect should be OK. Domain name resolution should be OK. ● <**version**> The new version which customer want to update, if you omit it,the module will update to the newest version in the OTA server. The <**version**> just support when <**mode**>=1 or 2. ● When <**mode**>=5

	need parameter <**len**> and <**md5**>. Local download need use AT+CFLE and AT+CFLW.

19.2.2 AT+CFLE Flash Erase

AT+CFLE Flash Erase	
AT+CFLE=<mode>,<addr>,<num>	Response **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<mode>** 0 Erase FOTA update partition 1 Erase flash reserved partition **<addr>** Erase address 0 FOTA partition address is fixed when <mode>=0 138346496-138412032 Flash reserved partition valid address area (0x083F0000-0x08400000), the value should be decimal format, when <mode>=1. **<num>** Flash block number 1-145 Flash block number when <mode>=0 1-16 Flash block number when <mode>=1
Parameter Saving Mode	NO_SAVE
Reference	Note ● FOTA partition 0x0830F000-0x083A5000,600KB ● FOTA update partition 0x08313000- 0x083A4000,580KB ● FLASH reserved partition 0x083F0000-0x08400000,64KB ● The size one flash block is 4KB

19.2.3 AT+CFLW Flash Write

At+CFLW Flash Write	
AT+CFLW=<mode>,<addr>,<len>,<offset>,<timeout>	Response **">",** Then enter data mode for inputting data until <len> is meet, and write data to flash. **OK** If <timeout> expired,cancel the operation **ERROR** If error is related to ME functionality: **+CME ERROR: <err>**

	Parameters **<mode>** 0 Write FOTA update partition 1 Write Flash reserved partition **<addr>** Write address 0 FOTA partition address is fixed when <mode>=0 138346496-138412032 Flash reserved partition valid address area (0x083F0000-0x08400000), the value should be decimal format **<len>** The data-length for writing, maximum 512 bytes each time **<offset>** The offset added for writing not exceeding 580KB when <**mode**>=0 not exceeding 64KB when <**mode**>=1 **<timeout>** Timeout for writing, unit: s, maximum 100s
Parameter Saving Mode	NO_SAVE
Reference	Note ● Before write flash,should erase flash first

19.2.4 AT+CFLR Flash Read

AT+CFLR Flash Read	
AT+CFLR=<addr>,<len>	Response **+CFLR: <data>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
	Parameters **<addr>** 138346496-138412032 Flash reserved partition valid address area (0x083F0000-0x08400000), the value should be decimal format. 137441280-138035200 FOTA update partition (0x08313000-0x083A4000), the value should be decimal format. **<len>** The data-length for reading, maximum 512 bytes each time **<data>** The data which is read will be putted out by UART port
Parameter Saving Mode	NO_SAVE
Reference	Note ● FOTA update partition not support read.

20 Supported Unsolicited Result Codes

20.1 Summary of CME ERROR Codes

Final result code **+CME ERROR: <err>** indicates different meaning. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.
<**err**> values used by common messaging commands:

20.1.1 CME Error Codes Related to mobile equipment or network

Code of <err>	Meaning
0	phone failure
1	no connection to phone
2	phone-adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string

30	no network service
31	network timeout
32	network not allowed - emergency call only
40	network personalisation PIN required
41	network personalisation PUK required
42	network subset personalisation PIN required
43	network subset personalisation PUK required
44	service provider personalisation PIN required
45	service provider personalisation PUK required
46	corporate personalisation PIN required
47	corporate personalisation PUK required
48	hidden key required
50	Incorrect Parameters
100	Unknown

20.1.2 CME Error Codes related to PSD and Packet Domain

Final result code **+CME ERROR: <err>** indicates an error related to PSD and Packet Domain. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning
103	Illegal MS
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
151	Last PDN Disconnection not allowed
577	PSD - activation rejected by GGSN
578	PSD - unspecified activation rejection
579	PSD - bad code or protocol rejection

580	PSD - can't modify address
581	PSD - CHAP close
582	PSD - profile (cid) currently unavailable
583	PSD - a profile (cid) is currently active
584	PSD - combined services not allowed
585	PSD - conditional IE error
586	PSD - context activation rejected
587	PSD - duplicate TI received
588	PSD - feature not supported
589	PSD - service not available
590	PSD - unknown IE from network
591	PSD - implicitly detached
592	PSD - insufficient resources
593	PSD - invalid activation state (0-1)
594	PSD - invalid address length
595	PSD - invalid character in address string
596	PSD - invalid cid value
597	PSD - invalid dial string length
598	PSD - mode value not in range
599	PSD - invalid MAND information
600	PSD - SMS service preference out of range
601	PSD - invalid TI value
602	PSD - IPCP negotiation timeout
603	PSD - LCP negotiation timeout
604	PSD - LLC error
605	PSD - LLC or SNDCP failure
606	PSD - lower layer failure
607	PSD - missing or unknown APN
608	PSD - mobile not ready
609	PSD- MS identity not in network
610	PSD- MSC temporarily not reachable
611	PSD- message incompatible with state
612	PSD- message type incompatible with state
613	PSD- unknown message from network
614	PSD- NCP close

615	PSD- network failure
616	PSD- no echo reply
617	PSD- no free NSAPIs
618	PSD- processing of multiple cids not supported
619	PSD- no PDP context activated
620	PSD- normal termination
621	PSD- NSAPI already used
622	PSD- address element out of range
623	PSD- PAP close
624	PSD- PDP context w/o TFT already activated
625	PSD- pdp type not supported
626	PSD- peer refuses our ACCM
627	PSD- peer refuses our IP address
628	PSD- peer refuses our MRU
629	PSD- peer re-requested CHAP
630	PSD- profile (cid) not defined
631	PSD- unspecified protocol error
632	PSD- QOS not accepted
633	PSD- QOS validation fail
634	PSD- reactivation required
635	PSD- regular deactivation
636	PSD- semantic error in TFT operation
637	PSD- semantic errors in packet filter
638	PSD- semantically incorrect message
639	PSD- service type not yet available
640	PSD- syntactical error in TFT operation
641	GPRS - syntactical errors in packet filter
642	PSD- too many RXJs
643	PSD- unknown PDP address or type
644	PSD- unknown PDP context
645	PSD- user authorization failed
646	PSD- QOS invalid parameter
647	PSD- FDN failure
649	PSD- bad pdp context parameters
650	PSD- PDPcontext already active

651	PSD- LCP termination negotiation timeout
652	more than one double colon in IPv6 address
653	IPv6 address ended with part of an IPv4 address
654	IPv6 address used dotted-decimal form outside an IPv4 address
655	in an IPv6 address, a byte of an IPv4 address was too big, causing overflow
656	in an IPv6 address, a byte of an IPv4 address was missing
657	in an IPv6 address, a byte of an IPv4 address was more than 255
658	in an IPv6 address, a byte pair was more than hex ffff
659	in an IPv6 address, a byte of an IPv4 address was too short or contained invalid characters
660	an IPv6 address was too short or contained invalid characters
661	in an IPv6 address, a byte pair was too big, causing overflow
662	an IPv6 address started with a single colon
663	an IPv6 address ended with a single colon
664	an IPv6 address contained an IPv4 address other than at the end
665	an IPv6 address was too long
666	an IPv6 address was followed by invalid characters
670	PSD - operator Determined Barring
671	PSD - activation rejected by GW or PDNGW
672	PSD – PTI already in use
673	PSD – EPS Bearer Context without TFT already activated
674	PSD - PTI mismatch
675	PSD - PDN Type IPV4 only allowed
676	PSD – PDN Type IPV6 only allowed
677	PSD – single address bearers only allowed
678	PSD – ESM information not received
679	PSD – PDN connection does not exist
680	PSD – multiple PDN connection not allowed for one APN
681	PSD – collision with network initiated request
682	PSD – unsupported QCI value
683	PSD – invalid PTI value
684	PSD – incompatible APN restriction value
685	PSD – reactivation request
690	LTE - IMSI unknown in HSS
691	LTE - illegal UE

692	LTE - EPS service not allowed
693	LTE - EPS and non EPS Service not allowed
694	LTE - UE ID cannot be derived
695	LTE - EPS tracking area not allowed
696	LTE - roaming not allowed in TA
697	LTE - roaming not allowed in PLMN
698	LTE - no suitable cells in TA
699	LTE - CS domain not available
700	LTE - ESM failure
701	LTE - MAC failure
702	LTE - synch failure
703	LTE - congestion
704	LTE - UE security capability mismatch
705	LTE - security mode rejected, unspecified
706	LTE - UE not authorized in CSG cell
707	LTE – non-EPS authorization unacceptable
708	LTE - CS domain temporarily unavailable
709	LTE - no EPS bearer context activated
710	PSD – PSD Mode not possible
711	PSD – invalid connection type
712	PSD – no free PSD bearer IDs
713	PSD – no free PSD PTIs
714	PSD – unable to open data connection
715	PSD- Incorrect username/password

20.1.3 CME Error Codes related to select TE character set

Final result code **+CME ERROR: <err>** indicates an error related to select TE character set. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning
737	+CSCS type not supported
738	+CSCS type not found

20.1.4 CME Error Codes related to preferred operator list

Final result code **+CME ERROR: <err>** indicates an error related to preferred operator list. The

operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning
741	must include <format> with <oper>
742	incorrect <oper> format
743	<oper> length too long
744	SIM full
745	unable to change PLMN list
746	network operator not recognized
747	access technology missing
748	access technology not supported

20.1.5 CME Error Codes related to Restricted/Generic SIM Access

Final result code **+CME ERROR: <err>** indicates an error related to Restricted/Generic SIM Access. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning
749	invalid command length
750	invalid input string
751	command not allowed for 3G SIM
752	Invalid <pathid> parameter
753	missing required commandparameter
754	invalid SIM command
755	invalid File Id
756	missing required P1/2/3 parameter
757	invalid P1/2/3 parameter
758	missing required command data
759	invalid characters in command data

20.1.6 CME Error Codes related to Miscellaneous Proprietary

Final result code **+CME ERROR: <err>** indicates an error related to Miscellaneous Proprietary. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning

720	SIM toolkit menu has not been configured
721	SIM toolkit already in use
722	SIM toolkit not enabled
724	MMI profile not updated
725	invalid SIM toolkit proactive command ID
726	invalid SIM proactive command response data
765	invalid input value
766	unsupported value or mode
767	operation failed
768	multiplexer already active
769	unable to get control of required
770	SIM invalid - network reject
772	SIM powered down
773	SIM File not present
794	invalid input value
795	No valid GId

20.1.7 CME Error Codes related to report Network State

Final result code **+CME ERROR: <err>** indicates an error related to report Network State. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.
<**err**> values used by common messaging commands:

Code of <err>	Meaning
840	No Service state
841	In cell search state
842	ERRC is deactivated
843	In cell reselection state
844	In L1 test mode
845	In reestablishment state
846	In PSM state
847	No data transfer in idle state

20.2 Summary of CMS ERROR Codes

Final result code **+CMS ERROR: <err>** indicates an error related to message service or network. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning
1	Unassigned(unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message type not compatible with protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
300	ME failure
301	SMS reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM pin necessary
312	PH SIM pin necessary
313	SIM failure
314	SIM busy

315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network
332	network timeout
340	no+CNMA acknowledgment expected
500	Unknown
512	SIM not ready
513	unread records on SIM
515	PS busy
516	Couldn't read SMS parameters from SIM
517	SM BL not ready
518	invalid parameter
519	ME temporary not available
528	Invalid (non-hex) chars in PDU
529	Incorrect PDU length
530	Invalid MTI
531	Invalid (non-hex) chars in address
532	Invalid address (no digits read)
533	Incorrect PDU length (UDL)
534	Incorrect SCA length
536	Invalid First Octet (should be 2 or 34)
537	Invalid Command Type
538	SRR bit not set
539	SRR bit set
540	Invalid User Data Header IE

20.3 Summary of CIS ERROR Codes

Final result code **+CIS ERROR: <err>** indicates an error related to OneNet. The operation is similar to ERROR result code. None of the following commands in the same Command line is

executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning
651	Memory error
652	Paramter error
653	Unsupported format
654	SDK error
655	Not find

20.4 Summary of TLS ERROR Codes

Final result code **+TLS ERROR: <err>** indicates an error related to message service or network. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<**err**> values used by common messaging commands:

Code of <err>	Meaning
-66	Failed to open a socket
-67	Buffer is too small to hold the data
-68	The connection to the given server / port failed
-69	The context is invalid, eg because it was free
-70	Binding of the socket failed
-72	Could not listen on the socket
-74	Could not accept the incoming connection
-76	Reading information from the socket failed
-78	Sending information through the socket failed
-80	Connection was reset by peer
-82	Failed to get an IP address for the given hostname
-8320	Unavailable feature, e.g. RSA hashing/encryption combination
-8448	Requested OID is unknown
-8576	The CRT/CRL/CSR format is invalid, e.g. different type expected
-8704	The CRT/CRL/CSR version element is invalid
-8832	The serial tag or value is invalid
-8960	The algorithm tag or value is invalid
-9088	The name tag or value is invalid
-9216	The date tag or value is invalid

-9344	The signature tag or value invalid
-9472	The extension tag or value is invalid
-9600	CRT/CRL/CSR has an unsupported version number
-9728	Signature algorithm (oid) is unsupported
-9856	Signature algorithms do not match
-9984	Certificate verification failed e.g. CRL, CA or signature check failed
-10112	Format not recognized as DER or PEM
-10240	Input invalid
-10368	Allocation of memory failed
-10496	Read/write of file failed
-10624	Destination buffer is too small
-28800	The requested feature is not available
-28928	Bad input parameters to function
-29056	Verification of the message MAC failed
-29184	An invalid SSL record was received
- 29312	The connection indicated an EOF
- 29440	An unknown cipher was received
- 29568	The server has no ciphersuites in common with the client
-29696	No RNG was provided to the SSL module
- 29824	No client certification received from the client, but required by the authentication mode
- 29952	Our own certificate(s) is/are too large to send in an SSL message
- 30080	The own certificate is not set, but needed by the server.
- 30208	The own private key or pre-shared key is not set, but needed
- 30336	No CA Chain is set, but required to operate
- 30464	An unexpected message was received from our peer
- 30592	A fatal alert message was received from our peer
- 30720	Verification of our peer failed
- 30848	The peer notified us that the connection is going to be closed
- 30976	Processing of the ClientHello handshake message failed
- 31104	Processing of the ServerHello handshake message failed
- 31232	Processing of the Certificate handshake message failed
- 31360	Processing of the CertificateRequest handshake message failed
- 31488	Processing of the ServerKeyExchange handshake message failed
- 31616	Processing of the ServerHelloDone handshake message failed
- 31744	Processing of the ClientKeyExchange handshake message failed
- 31872	Processing of the ClientKeyExchange handshake message failed in DHM / ECDH Read Public

- 32000	Processing of the ClientKeyExchange handshake message failed in DHM / ECDH Calculate Secret
- 32128	Processing of the CertificateVerify handshake message failed
- 32256	Processing of the ChangeCipherSpec handshake message failed
-32384	Processing of the Finished handshake message failed
-32512	Memory allocation failed
-26624	The operation timed out
-26496	The client initiated a reconnect from the same port.
-26368	Record header looks valid but is not expected
-26240	The alert message received indicates a non-fatal error
- 26112	Couldn't set the hash for verifying CertificateVerify

20.5 Summary of Unsolicited Result Codes

URC	Description	AT Command
***MATREADY: 1**		
+CREG: <stat>[,<lac>,<ci>]	There is a change in the MT network registration status or a change of the network cell.	AT+CREG=<n>
+CSMINS: <n>,<SIM inserted>	Indicates whether SIM card has been inserted.	AT+CSMINS=1
+CENG: <cell>,"<arfcn>,<rxl>,<rxq>,<mcc>,<mnc>,<bsic>,<cellid>,<rla>,<txp>,<lac>,<TA>"	Report of network information.	AT+CENG=<mode>[,<Ncell>] <mode>=2
+CPIN: <code>	Indicates whether some password is required or not.	AT+CPIN
+CPIN: NOT READY	SIM Card is not ready.	
+CPIN: NOT INSERTED	SIM Card is not inserted.	
+CSQN: <rssi>,<ber>	Displays signal strength and channel bit error rate when <rssi>,<ber>values change.	AT+EXUNSOL="SQ",1
+CR: <serv>	An intermediate result code is transmitted during connect negotiation when the TA has determined the speed and quality of service to be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) appears.	AT+CR=1

NORMAL POWER DOWN	SIM7020 is powered down by the PWRKEY pin or AT command "AT+CPOWD=1".	
UNDER-VOLTAGE POWER DOWN	Under-voltage automatic power down.	
UNDER-VOLTAGE WARNNING	under-voltage warning	
OVER-VOLTAGE POWER DOWN	Over-voltage automatic power down.	
OVER-VOLTAGE WARNNING	over-voltage warning	
+CDNSGIP: 1,<domain name>,<IP>[,<IP2>]	DNS successful	AT+CDNSGIP
+CGREG: <stat>[,<lac>,<ci>]	Network Registration Status	AT+CGREG=<n>

21 AT Commands Examples

21.1 CoAP command

Demonstration	Syntax	Expect Result
Create CoAP client and get CoAP client ID	AT+CCOAPNEW="10.161.11.104",5683,1	**+CCOAPNEW:1** **OK**
Get CoAP server counter	AT+CCOAPSEND=1,12,"400141C7B7636F756E746572"	**OK**
Nnotify CoAP server counter "024" via URC		**+CCOAPNMI: 1,11,"60457233c02105ff303234"**

22 ATC Differences among SIM7020 Series

22.1 AT+CSCLK

SIM7020C,SIM7020E,SIM7020G,SIM7060, SIM7060R	SIM7030
AT+CSCLK=? +CSCLK: (0-2) OK	AT+CSCLK=? +CSCLK: (0,2) OK
Difference: SIM7030 only support the paramerer <n> equal to 0 and 2.	

22.2 AT*MEDRXCFG

From 1752B07SIM7020C/E version supports the command.

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